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# Improving math instruction in schools that serve the poor

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# IMPROVING MATH INSTRUCTION IN SCHOOLS THAT SERVE THE POOR

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## ABSTRACT

Public alarm concerning how well U.S. schools are performing in mathematics compared to other developed nations is increasing. Reports of inadequate teaching, poor curriculum design, and low performance on standardized test have been fueled by the media. These issues in American mathematics classrooms are far compounded in schools that serve the poorest in America. When comparing mathematical proficiency rates of U.S. schools with other countries, schools with less than 25% free and reduced lunch score competitively with counterparts in other countries. In contrast, schools with rates of free and reduced lunch higher than 50% score dismally in comparison. Conditions such as poorly trained teachers, lack of support, insufficient instructional programs, focus on low level skills, low expectations, overwhelming workloads, poor work conditions all contribute to the inferior level of instruction received by students in these schools.

There are, however, schools that serve students of poverty that are beating the odds and performing on par and in some cases better than schools that serve more affluent students. To determine what can be reproduced elsewhere, this thesis take a look what is taking place in these schools: a demanding curriculum, implementation of problem solving, deep understanding and communication of mathematics, continual reworking of curriculum, using varied instructional practices, building relationships, and teacher leadership. For instructional practices to improve, teachers must step up and become leaders in the classroom to impact the environment and school culture. Six principles are discussed that are critical to making the changes necessary to impact student achievement in schools that serve the poor.

To assist in the battle to improve instruction and student learning in schools that serve the poor, colleges and universities can play a critical role. This thesis describes the preliminary outcomes of two large-scale LSU projects at high need, high poverty schools in the Greater Baton Rouge area: the Pilot Professional Development Project and the Baker Project. It is hoped that the lessons learned will help others to start similar programs at one of the many schools that serve the poor that in dire need for help from higher education mathematics departments.

# CHAPTER 1: SETTING THE STAGE

## 1.1 State of Mathematics Education

Research has shown evidence of mathematical weakness in the performance of U.S students. This has been shown through state, national, and international tests given over the last 30 years (Kilpatrick, Swafford et al. 2001). Although students in the U.S. have proven to be functional in performing computational procedures, they have gaps in their understanding of basic mathematical concepts. They also tend to struggle to apply mathematical skills to approach simple problem solving. Nationally, math scores have been traditionally low. Comparing curriculum of U.S schools to that of other well performing countries, mathematics curriculum in the U.S. have been portrayed as being shallow and lacking rigor. Math textbooks in the U.S tend to cover more topics, but generally at a more superficial level than its counterparts in other countries. Instruction places great emphasis on paper and pencil skills in arithmetic through teacher demonstration of procedures followed by repetitious practice of students. Despite the fact that U.S. schools are, on the average, underperforming schools in industrial nations around the world, there are many schools in America that are competitively performing among the best worldwide. These schools, however, tend to be schools with poverty rates below 25% (McCabe 2010). Many schools, especially those serving students in high poverty communities, are failing to give students the opportunities needed to succeed at high levels. The issues facing American mathematics classrooms are compounded exponentially in schools serving these students. Conditions ranging from poor teacher training, low expectations, lack of motivation, absence of administrative support, scarce resources, and other social environmental conditions all contribute to the subpar mathematics education in these schools. In 2008, 71 Louisiana public schools were

labeled Academically Unacceptable Schools (AUS), all of which had free and reduced lunch rates of 50% or higher.

Across the country, an increasing number of universities have offered their support to public k-12 schools in their communities. This reflects the commitment of these universities to assist these schools and their districts to set and meet standards that give students access to and prepare them for success in college. The Louisiana Board of Regents is a national leader in promoting school improvement through k-16 partnerships. Local universities in Louisiana, through funding provided by the Board of Regents, the Louisiana Systemic Initiatives Program (LASIP), the National Science Foundation (NSF), the U.S. Department of Education as well as other organizations and sources, are partnering with some high needs schools to raise the level of instruction and student achievement. These schools have been labeled Academically Unacceptable Schools (AUS) by the state education department for consecutive years. A school receives this status after four years of failing academic performance. Through these partnerships and funding sources, these schools are receiving assistance and support to improve student learning and performance on state standardized tests. This assistance includes job embedded professional development and support in math content, site visits, and mentoring instructional specialists at each of the schools, all geared toward positively impacting student achievement. The information gained from these experiences and partnerships provides important insights into the strengths and challenges of working across the k-12 and higher education sectors. It is the purpose of this thesis to describe some of the resources and make them accessible to university mathematics faculty when working with schools that serve the poor.

The book *Mathematics Education at Highly Effective Schools that Serve the Poor* (Kitchen, DePree, et al. 2007) outlines school-level and classroom-level characteristics that distinguish effective schools that serve the poor from ineffective schools that serve similar students. In 2002, Hewlett Packard established a High Achieving Schools Grant Initiative to acknowledge and bring attention to high performing, high poverty schools around the country (see www.unm.edu/~jbrink/HASchools/proposal.html). The schools selected demonstrated high achievement despite a high rate of students at or below the poverty level. The grant awarded resources and support for technology implementation into mathematics instruction in these schools. Research was conducted on nine highly effective schools awarded in the grant, all of which serve low income or high poverty communities. Each of the schools selected had free or reduced lunch rates of 50% or higher and sustained exemplary mathematical academic achievement over a minimum span of 3-5 years (Kitchen, DePree, et al. 2007). In addition, the awarded schools would participate in a research study to explore the reasons for their success despite having the typical challenges that accompany high poverty schools. Three themes critical to success were pervasive in all of the participating schools in the study. These themes, highlighted *in Mathematics Education at Highly Effective Schools that Serve the Poor* (Kitchen, DePree, et al. 2007), were;

- High Expectations and Sustained Support
- Challenging Mathematical Content and High Level Instruction
- Relationships that Teachers Build Among Themselves and with Students.

These fundamental themes that appear to be essential for all of the high performing high poverty schools in this study will be further explored following the description given in (Kitchen, DePree, et al. 2007).

High Expectations and Sustained Support: Both are essential to success. High expectations are the standards of effort and achievement teachers hold students to. Students perform best when it is expected of them to excel academically. Although, high expectations are admirable, they must be coupled with sustained support. When teachers support student learning, students are enabled to perform at their best and meet those high expectations. Without sustained support, high expectations become unrealistic and unreachable goals where students are expected to more or less sink or swim. In the absence of high expectations, sustained support can become a misuse of resources and an endorsement of failure (Kitchen, DePree, et al. 2007).

Challenging Mathematical Content and High Level Instruction: If continually exposed to a lack of challenging mathematical content and instruction, students fall further and further behind in mathematical maturity each year. Unfortunately, this is especially true for students in low achieving low income schools across the nation. Rigorous and challenging mathematics is needed in order to close this achievement gap. Mathematical content is challenging when it meets students at the extreme edge of their own ability and requires a concerted effort to obtain mastery. In addition, content is most meaningful for students when it is delivered in a way that effectively engages them. Developing the capacity of students to do challenging mathematics requires rich, worthwhile mathematical activity. Instruction that goes beyond what students are expected to know on standardized tests will produce higher levels of student achievement (Kitchen, DePree, et al. 2007). Delivering instruction in such a way that effectively engages students is always a challenge and was especially so in the schools that participated in the Hewlett Packard initiative. Meeting the challenge of high academic achievement becomes almost

impossible without the nurturing of professional relationships based on shared vision, goals and objectives.

Relationships that Teachers Build Among Themselves and with Students

Relationships among faculty members are created from and support the achievement of shared purpose. This shared purpose includes efforts to improve curricular offerings, creating collaborative student learning environments, shifting from teaching mechanics to deeper understanding of mathematical ideas. This shared purpose also compels teachers to work collaboratively, be supportive of each other, and ensure students understand and excel in mathematics (Kitchen, DePree, et al. 2007). The findings of *Mathematics Educaton at Highly Effective Schools That Serve the Poor* concur, to a large degree, with my personal experiences gained over the last several years.

1.2 Personal Experience

Several years ago, I participated in a project funded by the National Science Foundation that brought together a number of teachers from the school district in which I worked and other nearby districts to support teaching that produced better prepared mathematics students. During my involvement in that program, I was approached by one of the program directors about teaching in a failing school in the district that was in dire need of strong certified math teachers. This director was part of a university partnership with the school to help turn it around academically. The program required a two year commitment to teach at this failing school, after which I could either return to the school I had previously taught or continue at this once failing school. Initially, I thought "not interested." There was nothing attractive about this situation. Besides, I was chosen to be department chair at my current school for the upcoming school year,

where I was quite comfortable. However, after more discussion and consideration I agreed to take on the challenge.

The more I thought and contemplated about the possibilities of this undertaking, the more appealing the situation became. This would be my opportunity to really make a difference with children that wanted to do and be better but were never given the access and opportunity they needed to be successful. I was going to give them the tools they needed to go out and do positive things in the world. These students would be empowered to not only be great thinkers but model citizens that would impact their community for the better. They would come back years later, after beginning successful careers, to thank me for uniquely changing the course of their lives forever. Naively thinking, I had no idea of what I was up against.

This school, which was in school improvement level four, served approximately 800 students in grades six through eight. The student population was 99% African American of which 93% qualified for free or reduced lunch. In addition, 249 students were at least two grade levels behind. Five of the nine elementary feeder schools were in school improvement level two. State assessment scores were dismal with 88% of eighth graders failing to score basic levels in mathematics. Prior to the current school year, this school had been plagued with high teacher and administrative turnover, behavioral chaos, poor working conditions, high percentages of inexperienced and/ or uncertified teachers, deficient administrative support, a great deal of energy and focus of classrooms on control, scarce resources, low expectations, poor academic performance, apathy on all levels from administration down to students, and an overall environment not conducive to learning. This school was literally a textbook case of what a failing school looks like. The school was undergoing a reconstitution. Under this Reconstitution

Plan goals were set to hire more highly qualified staff, reduce class sizes, offer special programs to assist students, connect with the community, and collaborate with local universities.

The school year began with a two day retreat at a hotel outside of town, a few days before students returned from summer break, which welcomed new and existing faculty members to the new school year. The intent was for faculty to have time to bond as well as gain insight into the vision for turning around the school. Each day the faculty received inspirational as well as practical training to start off the new school year with a bang. In addition, faculty members had time to meet departmentally to lay out plans for the new school year. Without knowing the issues to be faced, the plan seemed viable.

There are good intentions and there are good actions. The two are can be as far apart as heaven and hell. The school year began with such promise and ambition. We all had visions of how we would impact the lives of the students that would enter our classrooms. I was part of a group of teachers recruited to be a part of the faculty through the university partnership. Many of the current faculty had little teaching experience and/or were not certified to teach. Being that we were experienced, certified teachers, we were given titles of leadership in our respective departments. This is where I first started to notice potential issues. These teacher leader positions were part of the university partnership agreement. However, in my opinion, these positions were never fully recognized or supported by the school administration. There was perceived resentment from some of the other faculty members as well.

As the year progressed, it became progressively more apparent that there was tension between the university partners and the school administration. It seemed as if the school administration wanted to prove that despite a lack of needed experience they could turn the

school around without the assistance of the partnering university. It is possible that the university could have done more to insist on taking a more active role in turn around despite the preference of the school administration. This tension was a significant impedance to progress. The university partnership also brought in a Math/ Science coordinator along with an English/ Social Studies coordinator. These people were to be resources and sources of guidance to the faculty in their respective subject areas. Because of their association with the university, the coordinators were viewed adversarially. Consequently, they were never fully utilized, while I was at this school, to help improve teaching practices and student learning. It became all too apparent to me that personal agendas were more important than student achievement. Unfortunately, personal agendas do not seem to set a positive tone for creating relationships among faculty members that develop from a shared purpose.

The administrative team consisted of a principal, two assistant principal, two deans of students and a time out room moderator. Between the principal and the two assistants, there was less than two years administrative experience combined. This experience was earned on the same campus in a very challenging and unstable environment the previous year. Establishing effective discipline practices, setting clear performance standards for staff, and presenting a clear vision for the school community was virtually out of reach of accomplishment. This lack of experience, I believe, also contributed to the perceived intimidation by the administration of the university partners. These partners were seen as threats rather than assets by the administration. Moves made by the university team to assist the school were often viewed as power moves to undermine the administration. With the level of conflict escalating almost daily between the administration and partners, progress seemed to be moving beyond our grasp.

Turning a school around is no small task. It requires intentional and deliberate skill sets to successfully accomplish. Personally, I feel that the lack of these skill sets exposed the inexperienced administrative staff consistently. It was first exposed in their inability to create an environment for learning. In prior years, this school had been inundated with behavioral problems. Despite having five individuals on the administrative team of a school with less than 600 students, they were unable to come up with a viable plan to address the climate of negative behavior on the campus that hindered learning from the start of the school year. Fighting, blatant disrespect of teachers, and major class disruptions were all common behaviors displayed on a daily basis. Behavioral issues permeated the campus; in the halls, in the cafeteria, at bus arrival and dismissal, as well as in many classrooms. Energy seemed to be spent on putting out fires rather than preventative maintenance. It had been stated as a goal that the school would work with parents to reform and revive the Parent Teacher Association (PTA). All action or lack thereof indicated otherwise. Parental contact and communication is essential to education. Although the school had a full time community liaison on staff, the school was unable to develop any noteworthy relationship with parents.

Teacher collaborative teams lacked any continuity. The administration opted to use teacher collaboration time for grade level meetings rather than content specific departmental meetings suggested by the university partners. Though teachers met on a weekly basis, it became more of a bureaucratic mandate than true collaboration to improve student achievement. Many teachers had trouble understanding why weekly collaboration was essential to student achievement. Consequently, weekly meeting turned into bickering and complaining sessions about how awful the students were and the terrible job some teachers thought the administrative

staff was doing. Numerous attempts made by the partnering universities to attain content specific collaboration were met with resistance and never materialized.

Despite the enormous and daunting challenges we faced daily, many of us worked hard to increase student learning on that campus day in and out. Trying to maintain a high level of expectation in a climate of complacency and apathy was literally draining and left many of us totally exhausted almost on a daily basis. Efforts to get kids to think and express their thinking about mathematical concepts were met with great resistance and at times seemed futile.

In the spring of that same school year, the school received another academically unacceptable performance report from the previous year and was consequently placed in a special recovery school district. Lack of evidence of administrative support necessary to turn the school around was cited as one of the main reasons for this takeover. The school's inability to take advantage of existing partnerships and to establish new ones also contributed to the decision.

This was my first experience in attempting to help turn a failing school around. If it were just my own personal experience, it would probably not be worthwhile to report. However, I'm positive that there are thousands of teachers who have had similar experiences facing the many hurdles, disappointments, and challenges of failing schools. Fortunately, I had the proper support that encouraged me to continue as an educator. My concern, however, is for the many new teachers being placed in failing schools without proper support. It is the purpose of this thesis to help define and disseminate what the research finds to be necessary conditions for change that must be in place to attempt turning around a low achieving school serving the poor.

## 1.3 Conditions for Change

Research by effective teaching literature has consistently found that students of teachers whose practices focused on deep concepts, analytical reasoning, and construction of value outperformed classrooms that focused on mere coverage of content, rote memorization, and meaningless tasks (Kitchen, DePree, et al. 2007). Overall, high poverty schools have had little to no success in school reform efforts that would improve an entire faculty's ability to teach effectively. (Kitchen, DePree, et al. 2007) For math education reform to thrive in high poverty schools, there must be at least a minimum level of organizational capacity, which would include strong administrative support for change (Kitchen, DePree, et al. 2007).

In order to determine the best approach to instruction, an understanding of the standards and how they should be played out in a particular grade level must be considered. Courses that are correctly aligned allow teachers to quickly assess what students mastered in the preceding grade and to focus on building skills and knowledge, as opposed to consuming valuable time with unnecessary reviewing and re-teaching. The vertical alignment of mathematics curriculum insures that curriculum objectives are specific and build one upon another to insure that prerequisites are mastered, gaps are eliminated, and there is an increasing sophistication and rigor to teaching concepts, processes, and skills across the grades. Accomplishing this is emphatically implausible when there is a lack of collaboration between grade levels. A seamless flow of instruction from one grade level to the next optimizes student learning. Professional collaboration among grade levels increases the efficiency of instruction. Vertical alignment culminates in a common goal met for all students after successful completion of a program, See http://www.teacher2teacher.info/pdf/T2TVerticalAlignmentComponents.pdf.

Studies have shown that the socio-cultural environment of a school can contribute to student resistance to change (Kitchen, DePree, et al. 2007). Disruptive behavior, high truancy, high drop-out rates, and passive disengagement are all forms of resistance found in high poverty schools (Kitchen, DePree, et al. 2007). These roadblocks to reform are rarely considered in math teacher preparation programs (Kitchen, DePree, et al. 2007). Reformers of teaching advocate a style of teaching that serves to advance problem solving (Kitchen, DePree, et al. 2007). Attacking these barriers requires recognition that numerous layers of support, leadership and determination are essential to turning an academic program around. Such an undertaking requires the efforts of many dedicated individuals, university faculty and K-12 teachers alike, willing to close achievement gaps at all cost.

In addition**,** there are instructional practices that are conducive to student learning and achievement. Ideally, students posing and solving problems, making and proving conjectures, exploring puzzles, sharing and debating ideas are the type of activities that are expected in an active mathematical environment (Kitchen, DePree, et al. 2007). Solving problems algorithmically is stressed less when the concentration of a classroom is on mathematical exploring (Kitchen, DePree, et al. 2007).

Students taught to memorize algorithms to solve problems underperform significantly compared to those that are provided support to develop their own mathematical thinking to solve similar problems (Kitchen, DePree, et al. 2007). "Alternative assessment approaches that include open ended questions, presentations of solutions in both written and oral forms, and other performances send very different messages to students about what is important in mathematics learning. The shift from and emphasis on producing correct answers to the expectation that

students think and communicate, is a major one for many students and teachers" (Kitchen, DePree, et al. 2007).

"The curricula and instructional practices of effective schools show some promise for mitigating existing achievement gaps and contrasts sharply with rote instructional practices, promoted by the holding instrumentalist perspectives that historically have dominated the teaching of students of color and poor students" (Kitchen, DePree, et al. 2007).

# CHAPTER 2: MORE ON THE HEWLETT PACKARD HIGH ACHIEVING SCHOOLS GRANT INITIATIVE

As previously mentioned, the Hewlett-Packard High-Achieving Schools Grant Initiative targeted public schools in the United States that mainly serve low-income students who were very successful academically, especially in mathematics. In 2002, Hewlett -Packard and the University of New Mexico chose nine high achieving schools to support with resources to integrate the use of wireless mobile computing technology in their mathematics curriculum. Each of these schools received a wireless mobile lab, $7,500 for the support of the project implementation, technology integration support, participation in a three day summer institute, and an opportunity to share successes with the network of participant schools and the education community at large. Information on each of the schools was obtained through surveys completed by administrators, the applications completed by the schools, interviews conducted with teachers, students, administrators, classroom observations, classroom artifacts collected and achievement data at both the school and classroom levels (Kitchen, DePree, et al. 2007). In all of the participant schools, three fundamental themes permeated their success. What follows is a more elaborate description of the three named themes (high expectations and sustained support, challenging mathematical content and high level instruction, relationships that teachers build among themselves and with students) than previously given in Chapter 1. Based on my personal experience, there should be a serious attempt to include these crucial elements for success in teacher preparation and academic leadership programs.

## 2.1 High Expectations and Sustained Support

In each of the participating schools, five characteristics were pervasive relative to high expectations with sustained support for student achievement. These included:

- teaching and learning as priorities
- supplemental support for students
- Review of basic skills
- Making teaching resources available
- Regular teacher access to professional development opportunities

In the following these five characteristics of successful schools will be described in more detail.

### 2.1.1 Teaching and Learning as Priorities

"Teachers were adamant that administrators supported them as professionals, trusted them, and made it possible for them to focus on teaching. Teachers are freed from a lot of bureaucratic responsibilities. The schools created a safe and positive place to engage in the study of mathematical content and students were expected to respond by taking their learning seriously" (Kitchen, DePree, et al. 2007).

Disruptive behavior is not tolerated at these schools. A considerable amount of time was spent on outlining the expectations of students and the behavioral norms. Students take learning so seriously that they are even known to correct each other one of their peers gets out of line (Kitchen, DePree, et al. 2007). At three of the schools highlighted, YES College Preparatory and KIPP Academy of Houston and New York, students must attend summer school prior to enrollment where the focus is on high behavioral expectations.

"Teachers came to work to practice and improve their craft – teaching! This translates into an enthusiasm for teaching and learning that permeates the classroom at these highly effective schools" (Kitchen, DePree, et al. 2007). In an interview with a teacher from YES College Prep speaking about the work ethic of her students, one teacher states " I think it's the reason why they're pushing themselves, because they see us pushing ourselves" (Kitchen,

DePree, et al. 2007). A student stated "When they teach, they teach you with so much enthusiasm it makes you want to learn more (Kitchen, DePree, et al. 2007). " A teacher's beliefs about students' chance of success in school influence the teacher's actions with the students, which in turn influence students' achievement. If the teacher believes that students can succeed, she tends to behave in ways that help them succeed. If the teacher believes that students cannot succeed, she unwittingly tends to behave in ways that subvert student success or at least do not facilitate student success"(Steven Farr, 2010).

### 2.1.2 Supplemental Support for Students

Not only did these schools have high expectations, but they gave the sustained support in order for students to meet the level of expectation. Extensive remediation was provided to students to ensure their success. These schools provided multiple avenues to assist students. This included after school tutorial programs, teachers using their break time during the school day, as well as teachers being on call with school issued cell phones to assist students who would otherwise not have access to help away from the school. One school has a late bus that runs at 6:30 pm for students that want to stay after school to get extra help (Kitchen, DePree, et al. 2007).

### 2.1.3 Review of Basic Skills

Many students entered these schools performing below the basic level of proficiency for their grade level. This required some creativity in order to meet the needs of the incoming students. Some of these schools offer extended math class time or even additional supplemental math classes which allows for enrichment and deeper understanding of content. Students regularly reviewed skills learned in the past (Kitchen, DePree, et al. 2007).

### 2.1.4 Availability of Teaching Resources

Teachers have materials, manipulatives, specialists, technology, and wealth of resources at their disposal to use to support their teaching practices. Administrators gave support in ensuring that teachers had what they needed to make sure students were successful (Kitchen, DePree, et al. 2007).

### 2.1.5 Access to Professional Development Opportunities

Teachers frequently take advantage of professional development opportunities by getting involved in teacher workshops, university courses, grant projects and even peer coaching to enhance their craft (Kitchen, DePree, et al. 2007). "The focus on teaching and learning, the support given for student learning, professional development opportunities, and availability of teaching resources all promoted rigorous, enduring, and genuine learning environments at the schools" (Kitchen, DePree, et al. 2007). Teachers bought in to the concept of the school's success resting on their own willingness to put in the extra time to ensure that all students were successful. To illustrate the kind of instruction that produces results from high expectations and sustained support, the following summary of a sample lesson taken from (P Kitchen, DePree, et al. 2007) is a typical example.

Sample Lesson (P Kitchen, DePree, et al. 2007): A classroom lesson was observed on area and volume in a 7th grade algebra class of 30 students. The lesson begins with a review of graphing linear equations.

> "Daniel wants to build a rectangular sandbox for his little sister. He has 24 linear feet of board that is 1 foot high. What dimensions would allow for the greatest volume and what is the maximum volume."

Students were in groups of four and given a worksheet with tables and graph paper to assist in solving the problem. Students were encouraged to make sketches and graph the results

on a coordinate plane. As students were working, the teacher noticed that many of the groups were getting stuck. The teacher then stopped the entire class to further explain the concepts. They discussed the meaning of volume and derived the formula for volume. After sensing they understood, the teacher then had students to return to the assignment. Students began experiencing success with the assignment. The teacher circulated through the classroom to provide support and prompts as needed.

This class was a 90 minute session. At one point in the class, the teacher stopped the class to stretch. The teacher had them to stand and model various linear functions as she called them out. For example, she would say "Model y = 0," then, "Model y = -5x". The students would then model the slopes of the lines using their arms. This stretching activity helped to reenergize the students and review graphing at the same time.

"After the students finished the assignment, the teacher prompted them to look for patterns, draw conclusions, and graph their results" (Kitchen, DePree, et al. 2007). As the class discussed the assignment as a whole group, the teacher asked high level questions and challenged the students' understanding of the task and the concept of volume and surface area. This teacher demonstrated high expectations with support. When the students weren't getting it, the teacher stopped to further explain and help the students understand the mathematical concepts.

## 2.2 Challenging Mathematical Content and High Level Instruction

The participant schools exhibited mathematical content that was challenging to the students. Teachers also taught at a high level of instruction. Some ideas related to this theme include:

- Demanding mathematics curriculum

- Problem solving
- Students Communicate Mathematically and Engage in Inquiry
- Mathematics Curriculum is a Work in Progress
- Teaching Beyond the Test Using Varied Instructional Practices

### 2.2.1 Demanding Curriculum

Students are prepared for success on standardized test, but teaching extends beyond tested content and includes varied instructional practices (Kitchen, DePree, et al. 2007). Faculty members all agree that the textbooks are insufficient to meet curriculum needs alone. Therefore, to have a rigorous curriculum would necessitate the usage of multiple sources. At YES College Preparatory School, teachers "agreed on the most important mathematical ideas to include in the curriculum at each grade level and then focused on teaching those ideas" (Kitchen, DePree, et al. 2007).

Teachers at Emerald Middle School in San Diego, California were adamant about using the state standards to guide mathematical content coverage throughout the school year. Faculty members have embraced the standards as the benchmark for what should be taught (Kitchen, DePree, et al. 2007). Teachers also make adaptations to meet the needs of their students. If students come at the beginning of the year lacking in mastery of previous years' standards, teachers have to modify accordingly.

### 2.2.2 Problem Solving

When teachers at participating schools were asked what they thought were the most important mathematical ideas for their students to learn, problem solving and students ability to communicate mathematically were common responses. "Teachers often spoke directly of the

importance of their students learning how to think and reason, and this was accomplished through engaging in challenging problem solving activities" (Kitchen, DePree, et al. 2007).

One teacher states "Now, I'm really interested in do they have the big picture? I want them to know not just how to go about solving the problem but why do you go about doing that. What led to the development of those ideas? Obviously, I want them to be able to solve those problems. What I've seen over the last few years is that if they don't get the big picture in the beginning, all they're going to do is memorize their way through it" (Kitchen, DePree, et al. 2007).

Another teacher stressed the importance of teaching students to be independent thinkers so that they don't depend on teachers to think for them without trying (Kitchen, DePree, et al. 2007). One teacher stated, "I like to run a classroom where it is inquiry based, where students are asking a lot of questions. I'll do problems where I want them to problem solve. It might not be a problem that they've seen before, but they learn how to problem solve and try to figure out an answer even if it's not something I've exposed them to" (Kitchen, DePree, et al. 2007). A different teacher pointed out that although there are situations in which rote memorization has its value, being able to think things through and analyze are critical skills. A common thread among the participating teachers was that they did not solely use a skills based curricula and instruction (Kitchen, DePree, et al. 2007). These teachers worked hard to "develop students' problem solving skills and teach challenging mathematical content with the objective of positively impacting their students ability to think critically. "This finding lends strong support to the notion that at schools where the development of students' mathematical problem-solving skills is

prioritized, exceptional learning and high achievement take place" (Kitchen, DePree, et al. 2007).

Some of the problem solving strategies teachers incorporated included drawing pictures, show & tell and looking for patterns. Teachers wanted students to view math not only in the context of school, but as something useful in everyday life. For this reason problem solving was an essential part of the curriculum. Problem solving skills help students to become independent thinkers (Kitchen, DePree, et al. 2007).

### 2.2.3 Students Communicate Mathematically and Engage in Inquiry

Developing a deep understanding of mathematics was important to many of the teachers. For some schools this meant having extended classes helped to meet this goal. Theses extended periods gave teachers time needed to help students make mathematical connections (Kitchen, DePree, et al. 2007). "Many of the teachers discussed how much they valued students communicating mathematical ideas in class. Others described how they used instructional strategies in class that engaged students in mathematical inquiry" (Kitchen, DePree, et al. 2007) . One of the strategies used was collaborative groups. All of the strategies used were designed to challenge students and move them out of their comfort zone. One teacher observed that his students learned better when they had to communicate mathematical ideas. He also observed that retention increased when students communicated their ideas with each other (Kitchen, DePree, et al. 2007).

"Faculty members also believed in the importance of communicating mathematics understanding in both written and verbal form." In an effort to develop problem solving skills

and a deeper understanding of mathematics, communication was encouraged in group projects (Kitchen, DePree, et al. 2007).

### 2.2.4 Mathematics Curriculum as a Work in Progress

The participating teachers talked extensively about how their curriculum was continually evolving. They believed that it was vital to move beyond the perspective that a textbook defines the mathematics curriculum (Kitchen, DePree, et al. 2007). One teacher asserted that she and her colleagues have made considerable progress in the realization that the textbooks are not the curriculum in and of themselves. They are constantly looking for materials to supplement and aid in the development of the curriculum. The administration strongly supports the teachers in their efforts. Teachers felt "It was more important that students made meaning of what they were learning than it was for them to cover the material in the textbook" (Kitchen, DePree, et al. 2007).

From the interviews, teachers cared more about teaching the state standards than following a particular textbook. One teacher maintained that "The kids don't have a math book; we create all of that stuff on our own. This comes from various textbooks and things we've seen in the past and recreating materials we've used before" ( Kitchen, DePree, et al. 2007).

### 2.2.5 Teaching beyond the Test and Using Varied Instructional Practices

The teachers in the participating schools strongly believed that students should be prepared to meet requirements of state standardized test, but teaching should extend beyond the limits of the content of these tests. "By teaching mathematical content that went beyond state standards, they were not only preparing students for success on standardized test but future math classes as well (Kitchen, DePree, et al. 2007, p92). "Because they are the basis on which student

performance is evaluated, state testing scores have become a significant part of teacher evaluation (Kitchen, DePree, et al. 2007, p. 85).

Students' test data is constantly being used to drive instructional decisions. Previous year's scores are analyzed to determine the content that needs additional emphasis. The teachers at these participating schools worked tireless to ensure the success of their students, but without allowing the tests to dictate the mathematics curricula and instruction. Alternatively, teachers used high expectations for student achievement along with a means of support for students to excel in mathematics. This is done using a variety of instructional practices. These practices included discovery learning methods that help students to make sense of mathematics for themselves, and collaborative group work.

### 2.3 Building Relationships

The final theme, essential to successfully turning around failing schools, centers on relationships among teachers and between teachers and students. Four ideas that support this them include:

- A Strong Sense of Purpose among Mathematics Faculty
- Faculty that Collaborates and Supports each other
- A Focus on Students Disposition toward Mathematics
- Teachers that Understand and Care for their Students

### 2.3.1 A Strong Sense of Purpose among Mathematics Faculty

"Teachers at the participating schools shared a strong sense of purpose." One attribute common to all of the schools was high expectations for all students in mathematics. Additional instruction was offered to help students meet the expectations. "There's definitely a shared sense of responsibility", states one teacher. "Faculty members worked together to create a program that prepared students well in mathematics. Vertical teaming, technique sharing, and finding good models to observe are all practices these teachers employ in order to ensure the success of the students" (Kitchen, DePree, et al. 2007). Another teacher mentioned that student team building is a focus at her school. Cooperative grouping is used to build interdependence among team members, where the success of one benefits all. To positively impact their students' attitude toward mathematics well defined one faculty's sense of purpose.

### 2.3.2 Faculty That Collaborates and Supports Each Other

"Mathematics Teachers at the participating schools commonly expressed how they felt supported by their colleagues (Kitchen, DePree, et al. 2007). "Teachers worked together to horizontally and vertically align curriculums, share teaching ideas, discuss students' mathematical strengths and weaknesses, and even modify and write curriculum together" (Kitchen, DePree, et al. 2007). This collaborative work of the faculty members translated into student achievement and success. One teacher at Emerald Middle School pointed out that faculty worked in interdisciplinary teams at the school. This teacher also believed that the collaborative approach allowed for a focus on teaching rather than a focus on students with behavioral issues" (Kitchen, DePree, et al. 2007).

### 2.3.3 A Focus on Students Disposition toward Mathematics

Teachers conveyed concern for their students' overall affect, and wanted to enrich student confidence in mathematics while still making it challenging (Kitchen, DePree, et al. 2007). One teacher asserted the general academic abilities could be strengthened when students experienced success in mathematics (Kitchen, DePree, et al. 2007). Another expressed the importance of getting students to see the significance of mathematics to their everyday life, while building confidence in their mathematical abilities (Kitchen, DePree, et al. 2007).

### 2.3.4 Teachers that Understand and Care for their Students

Teachers expressed a genuine desired to build strong relationships with their students (Kitchen, DePree, et al. 2007). This was evidenced by the way in which teachers referred to the home conditions of many of their students and how they really cared about them. A student that understood the value her teachers placed on her success stated "Teachers are always encouraging you. They tell you the minute you walk in that they are available if we need help before and after school" (Kitchen, DePree, et al. 2007). Well aware of the circumstances many of their students lived in on a daily basis, these teachers felt it was crucial to still hold high academic expectations (Kitchen, DePree, et al. 2007). A teacher states "I think its nice for them to be able to see me as a person not necessarily just a teacher, even though we still have to have that student – teacher relationship. But they need to see that I'm human and I think that helps a lot" (Kitchen, DePree, et al. 2007). An environment of caring teachers builds trusting relationships between teachers and students.

Highly effective schools that provide education to high poverty communities demonstrate qualities and practices that less effective schools could benefit from (Kitchen, DePree, et al.

2007). These characteristics include having a greater percentage of effective teachers in terms of their concepts and practices relative to mathematics curriculum, instructions and assessment (Kitchen, DePree, et al. 2007). In addition, discipline policies, class schedules, student support services, and professional development objectives all center around student achievement (Kitchen, DePree, et al. 2007). Administrators, teachers, and parents work together to make sure that student learning is at the forefront of practices and policies. To ensure this, the administrators ensured that the school climate was conducive to a learning environment. "Student learning and teaching was a priority" (Kitchen, DePree, et al. 2007). " Constructing a school culture in which teaching and learning took president over everything else compelled school administrators and faculty to think seriously about both classroom discipline and relationship building. At two of the schools in this study, students were required to sign a contract stating their compliance to be subjected to rigorous conduct standards (Kitchen, DePree, et al. 2007). Parents were held accountable for the behavior and learning of their students as well in the contract (Kitchen, DePree, et al. 2007).

### 2.3.5 Challenges of Typical Schools That Serve the Poor

High expectations with sustained support, challenging mathematics and high level instruction, and relationships built among faculty members and between faculty and students are all ideal conditions for academic success. These qualities are essential to the success of any school regardless of the socioeconomic status of the students. Nonetheless, in typical schools serving the poor, these qualities that support academic success are far from common. There are a number of factors that contribute to the absence of qualities that promote high mathematical achievement. In summarizing research from a number of sources, (Kitchen, DePree, et al. 2007)

find many common characteristics of schools that serve the poor. These conditions contribute to the low level of instruction and learning found in similar schools.

- High percentage of inexperienced, un-credentialed and/or poorly trained teachers
- Highly bureaucratic organizational structures
- Lack of support for change
- Standardized and uncoordinated instructional programs that encourage a custodial attitude toward children
- High classroom focus on controlling students and teaching low level skills
- Low expectations of Students
- Overwhelming workload on teachers
- Poor work conditions in often dilapidated buildings

- Teachers feel bombarded by resistance to change by students, administrators, colleagues, parents and others. This hampers efforts to implement standards-based curriculum and instruction in classrooms.

The focus of teachers of high poverty students, in a study by Knapp and Woolverton, tends to be more on control of the classroom than on fostering student high level thinking, and in the process teaches students that little is expected of them except compliance to a rigid classroom environment. "Typical attitudes suggest Teachers are in charge and responsible. Students are those who still need to develop appropriate behavior. Therefore, when students follow teachers' directions, appropriate behavior is being taught and learned" (Knapp and Woolverton, 1999).

This pedagogy of poverty has been a major obstruction to closing the achievement gap between students of poverty and students in more affluent schools and communities.

Research consistently shows that teachers are less likely to deliver high level content and standards based instruction to students of color and those living in poverty (Kitchen, DePree, et al. 2007). Student demographics such as race, ethnicity, gender, and class all influence the implementation of standards based mathematics instruction. An inability to engage students of poverty or pre-existing low levels of expectation impede many teachers from implementing standards based teaching practices. "Challenges inherent in preparing prospective teachers to work in high poverty diverse schools have yet to be acknowledged" (Kitchen, DePree, et al. 2007). Coursework in multicultural teacher education programs has been relatively ineffective at challenging prospective teacher beliefs about racism, white privilege, and their belief that through hard work, it is possible to be successful in school and in mathematics. It is my personal belief that this is not a conscience decision the average teacher makes but is played out in practice because of an embedded belief that not all children are capable of learning at high levels.

Universities have a responsibility to address these challenges in prospective teacher preparation programs. Because of the challenges in these schools, critical skills are needed in order for teachers to be effective in preparing students in high needs school for academic success. Addressing these challenges will require stepping outside of the traditional realm of teacher preparation programs. Having opportunities to observe the challenges while in a teacher program can go a long way in allowing perspective teachers to brainstorm and develop strategies for addressing the needs and challenges of high needs schools. These experiences can be gained from site visits to high needs schools, interviews and/ or collaboration with faculty

members at high needs schools, and well as classes in teacher preparation programs that address the specific needs of high poverty high needs schools. Induction programs for new teachers can also be beneficial in ensuring that these teachers are prepared to be competent and successful in high needs schools. Universities can help ensure that prospective teachers are in schools where they receive the proper support in order to be successful.

# CHAPTER 3: TEACHER LEADER SKILL SETS

Despite the fact that many teachers across the country are failing in their attempts to generate significant student achievement or success with children in low income schools, there are others that are highly effective in the classroom and are experiencing phenomenal results. These highly effective teachers utilize distinguishable characteristics, knowledge, attitudes and skills that lead to their success in some of the most challenging of context. We will discuss six principles of leadership these teachers possess that lead to dramatic academic gains by students of low socioeconomic status. These principles are taken from the book *Teaching as Leadership; The Highly Effective Teacher's Guide to Closing the Achievement Gap (Farr, 2010).* While there is a plethora of material on teacher leadership on bookshelves today, this book aligned closely with the principles I've personally tried to employ in my teaching experience. The six principles are:

(I) Setting Goals

(II) Investing Students and their Families

(III) Plan Purposefully

(IV) Execute Effectively

(V) Continuously Increase Effectiveness

(VI) Work Relentlessly

## 3.1 Setting Goals

Setting big goals is essential to success. Big goals are the clear, ambitious, visions toward achievement a teacher sets for students. After teachers identify their students' performance level at the beginning of the year, they can then develop a vision with strong determination and expectation of where they will be at the end of the school year. These goals should be fueled by a vision that when reached will make an impact on students' academic trajectory and future opportunities (Farr, 2010). Growth and achievement are clear when goals are well defined. In this manner, students will value the benefits of their efforts. A teacher's vision can aid in directing, aligning, and inspiring the actions of students thereby generating positive change. Goals a teacher sets should be specific. Specific goals state exactly what the end results will be. When goals are specific, no ambiguity is left about determining what needs to be accomplished. Goals should be measurable. Measurability of goals allows one to gauge what has been accomplished in relation to the goal that has been set. If goals aren't measurable, there is no way to determine whether or not they have been met. Goals must also be attainable. Setting goals that are unrealistic will always end in disappointment. One must determine, with given resources and time available, what can be realistically done with hard work and effort. Goals must be relevant. Goals have to be set with a clear purpose in mind that merges succinctly into the overall vision. Goals must be time specific. Not having a time limit attached to goals can breed procrastination.

Goals are most useful when they are built on well established learning expectations as opposed to a teacher's own personal interest, assumptions, or intuition about what students should be learning (Farr, 2010). Preconceived notions about what students should be learning can distort the effectiveness of big goals. Setting goals for students based on what one was taught in the same grade or because one has a partiality toward a particular subject or skill instead of

standards based goals may lead to the detriment of student success. In addition, allowing the complexity of standards to become overwhelming can cause a teacher to prematurely abandon the standards for guidance of the big goals. Learning standards can prove beneficial to determining what goals need to be set for the year (Farr, 2010). By aligning the effort of the teacher, students, and their families and bringing urgency to learning, goals are maximized. These goals, when designed well become inspiring and motivating to teachers and students.

Teachers often attempt to develop values, temperament and life skills that will sustain the achievement and effort of their students. Although, these goals are sometimes expressed separate from academic goals, they are essential to each other and should be integrated together "One cannot simply tell students to have self esteem, or to be persistent, or to love learning; rather, these important characteristics are most effectively developed through the pursuit of something difficult and valuable – academic achievement (Farr, 2010).

Goals should be ambitious, meaningful, aligned with rigorous standards yet feasible. Questions that should be asked when setting goals should include:

- What measureable academic progress should my students achieve?
- What traits, mindsets, and skills will best serve my students?
- What pathways to opportunity are in front of my students that should inform the big goal?
- What students' interests and motivations could shape the big goal?

### 3.2 Investing Students and Their Families

Students are invested when teachers help them cultivate their passion for academic success and faith in themselves to achieve it (Farr, 2010). At this point, students employ their

own ambitious goals and work vigorously with focus to accomplish them. Students are able to work hard toward these big goals because they are convinced that these goals will make a real difference in their lives. The teachers' personal success is dependent on students sharing in the teachers' vision and ambition to reach the set goals. To accomplish this, teachers must invest in strong personal relationships with students built on trust and high expectations. A teacher must also demonstrate and sell the effort it takes to achieve these goals as well as develop a support system to encourage student efforts.

Big goals will not be reachable unless students can perceive the value of academic success. Teachers then have the task of not only helping students believe that they can be academically successful but also helping them fuel the desire to achieve. When students internalize the perspective of "I can" and "I want to", personal investment is optimized. This can be quite a challenging yet rewarding task.

Many of the students in low socioeconomic schools have had little success. These students sometimes discover early on that they are lagging academically. Over time, these students develop low expectations of themselves in the academic environment. "Sometimes children may bring a lifetime of being told that they are failures, or even worse, that they are developmentally disabled" (Farr, 2010). This can lead to students' resistance of their own investment. Students have to be convinced that success can be attained through hard work. When students can make the connection between their own success and hard work, self investment becomes more plausible.

Investing students cannot be done alone but requires the enlisted help of influential people in students' lives. These people may include family members, coaches, ministers, friends,

and even other teachers. Within this web of influence a network of well aligned messages is created that support the reward of hard work and the importance of reaching the big goal. Learning is optimized when the people most influential in students' live are invested as well (Farr, 2010).

"A teacher's outreach is what ultimately drives family and influencer investment" (Farr, 2010). Research implies that students from low income communities are less likely to have any sort of family involvement in their schooling. Family and influencer involvement materializes through explicit intervention. This may sometimes mean going above and beyond the call of duty to gain the investment of the people in a student's life. Creativity is sometimes necessary to intervention. Communication and feedback with family enable students to feel like they're a part of a network working for their betterment. Successful strategies for investing families include sending weekly newsletters home, having a daily homework agenda, electronic communication, tracking folders for assessments, bi-weekly progress reports, and celebratory calls. The chance of a students' success increases dramatically when communication and collaboration with family and influencers is done regularly.

Getting students to a place of understanding that through hard work they can achieve success is no simple task. However, there are several strategies that can be use to invest students. Creating a welcoming environment, developing a culture of achievement and ensuring instruction and learning are critical to investing students (Farr, 2010).

A welcoming environment gives students a sense of belonging. In this type of environment, students' self confidence and self esteem are strengthened. "When the classroom is an emotional and physically safe place for students, authentic learning can begin" (Farr, 2010).

Essential to creating a welcoming environment are building relationships with students, giving students a sense of community, and being available to students.

Building relationships entails getting to know students, their beliefs, and their history. When teachers are able to utilize the emotional engagement of their students and the knowledge it produces to drive investment, it results in greater achievement. Students name a teacher's care and concern as a significant factor that impacts their learning. Teachers gain the trust of their students when relationship building is initiated. Some methods used to build relationships include information surveys, individualized notes and email conversations, spending time together, sponsoring student activities, community involvement, and being available to students.

Relationships among students are vital to creating a sense of community in the classroom and optimizing the learning experience. When a classroom has a sense of community it is a warm, affirming and protective space for children to engage in learning. In this type of classroom students respect and support each other. Effective teachers use various strategies to build unity and interdependence in their classrooms. In these types of classrooms, students have a sense of belonging and do not feel isolated. This gives them the freedom to make an effort to achieve without feeling they would be judged or ridiculed by their peers. Some strategies for creating a sense of community include fostering an inclusive and positive atmosphere, building relationships among students, teaching and modeling tolerance and inclusion, empowering students with conflict resolution skills and systems. "When employing community building strategies, social skills require the same process as academic skills – objectives need to be diagnosed, introduced, practiced, and assessed for mastery" ( Kitchen, DePree, et al. 2007).

In the push to invest students in academic achievement, low expectations, stereotypes, and problematic distractions, all of which influence the mindsets, choices and actions of students, have to be combated. Ideas that academic achievement is valuable, hard work leads to achievement, and achievement requires team effort reinforce student investment. The goal for students is to internalize the value of academic achievement and take pride in the tangible signs of their academic growth.

Student value of academic achievement is realized with a demonstrated desire to achieve. Promoting these ideas to students builds a foundation for dialogue about how academic success leads to opportunities for success in other areas. Policies, systems, classroom design, and teacher actions are all aligned with these ideas.

In effective classroom, student progress is transparent. The teachers in these classrooms are constantly tracking student progress and giving students access to the representations of their progress. These representations may take the form of tables, graphs, charts, student folders, data binders as well as other forms. "These methods of representing student progress contribute to creating a culture of achievement, which in turn fosters student investment" (Farr, 2010). Seeing their progress helps students to believe they are progressing. These tangible signs of progress provide inspiration to students to continue pushing to achieve.

Students are more inclined to desire learning when they are able to see the relevance of what they are learning. Answering the question "why are we learning this" is critical and should be tied to student interest and aspirations. Establishing relevant content involves bringing real world content to all stages of instruction, from introducing new ideas, to practicing skills, to assessments. One example of this would be culminating demonstrations of student learning.

Creating a short book, presenting to another class, a classroom museum setup, and public service projects that involves newly mastered skills are all ways of demonstrating student learning. This offers students an opportunity to immediately demonstrate what they've learned. When students have opportunities to demonstrate their learning publicly they are more likely to make connections between what they are doing and the world beyond them.

Students are less likely to believe or desire to work hard and succeed when task difficulty are too hard or too easy. The opposite is true when they are working at the frontier of what is comfortable for them. This frontier is the nexus of challenge and ability. Motivation is at its optimum when students are challenged with work they are capable of being successful with. If work is too difficult, students may become frustrated. However, if the work is too easy, students may become bored. This will often require differentiation of instruction as all students will not be on the same level. Teaching material that is both challenging and within students' capacity to succeed at, reinforces the theory of malleable intelligence, the belief that intelligence is not necessarily inherit but potential that can be developed. When objectives start at a point that is realist for students to succeed, the intrinsic belief that "I can do this" garners increased commitment of effort to the task. Each success generates greater assurance and contentment and gives more force to the next challenging goal. The more challenging the goal, the greater the focus becomes. This translates into increased learning and deepened understanding (Farr, 2010).

### 3.3 Plan Purposefully

"In any endeavor, from lesson plans, to long term plans, to classroom management plans, successful teachers start by determining the end result they want to see in their students' learning and behavior. They are clear how they will know that result will be reached. Then they plan

backward from that result to their starting point, creating an efficient path to success" (Farr, 2010). Success starts with planning. Prior to the execution of a plan, a vision of the desired results and a clear definition of success are conceptualized. Subsequently, strategies can be chosen and designed in order to meet the goals set. State learning standards are the foundation of a clear vision of success. One then has to ask "How will I know that my students have reached that vision" (Farr, 2010)? Assessments designed prior to teaching aid in determining the direction of the instruction of standards. Successful teachers then determine what strategies are best suited to meet the goals of the standards. "All methods and materials used are shaped by a clear conception of the vision of desired results" (Farr, 2010). Consequently, the objectives for student learning must be obviously clear.

There are implications to assessments designed prior to teaching rather than after. When assessments are created after a unit is taught, student success is likely to reflect mastery of what was taught. When assessments are created prior to teaching the material, they inform the teacher's planning and choices for instruction. Students' success then reflects mastery of what was supposed to be learned. In addition, the teacher and students are held accountable to the plan for success reflected in the standards, not just the material the teacher was able to cover.

Starting with the goal in mind helps answer questions that otherwise would probably not be answered. "What makes sense to teach first? What can go together? These types of questions allow for building a unit plan that will break down each day and how it builds up to the assessment" (Farr, 2010). Keeping the daily unit and long term goals in perspective of each other is essential to staying on track. The practice of "thinking like an assessor" assists in illuminating

goals and ends in more precisely defined teaching and learning goals. In this way, students are well informed of the goals and perform better.

To some, this method may resemble teaching to the test. This is fine if the test is rigorous and meaningful. The disadvantage of teaching to the test is if it is done without rigor and only requires rote memorization and superficial knowledge opposed to critical thinking, inquisitiveness, creativity, and problem solving. Assessment involving deeper thinking is no simple task, but it is key to significant student achievement.

"Mapping the path is an exercise in alignment – ensuring that every step is contributing meaningfully to reaching the destination" (Farr, 2010). Imagining oneself in the classroom, performing the actions being planned is a practice of some highly effective teachers. In this manner, teachers can consider how to deal with issues such as misconceptions or differentiation. A great plan maps out a path to the objectives that support the goals and directs assumptions considering the context of the actual setting. Some things to consider include the nature, cognitive demand and rigor of a goal, the relative priority of content, students' prior knowledge, students' development, learning styles, and motivations. In addition, teachers also need to consider the learning modalities of students, their interest, pedagogical content knowledge, culturally relevant pedagogy, and time/ resources available.

Yearly plans map out the grouping and order of learning goals students will master in a school year. A unit plan charts a set of learning objectives over a fractional part of what the teacher will do to ensure student mastery of one of the unit's learning objective. "The correlation of the three types of plans mentioned is reminiscent of an online map as you zoom in from a broad view to a mid altitude, to a very specific view" (Farr, 2010). This is the essence of

backward design. It begins with the big goal of the long term plan in mind and zooms into the day to day actions of the lesson plan. Yearlong plans optimize learning by bringing attention and necessity to the forefront of planning and by showing exactly what has to happen in order to reach set goals. They provide a benchmark for where instruction is at any point in the year. The year long and unit plan help in clearing up and systematizing the knowledge and skills you will teach in ways that will be time and energy saving.

"A lesson plan is a map of instructional strategies and student learning experiences that leads students to master particular objectives that connect to long term instructional goals" (Farr, 2010). Lesson plans are the foundational blocks of a unit plan. There are a number of different forms and templates used for lesson planning. A commonly used form is the five step direct instruction plan. The steps are introduction, I do, we do, you do, and closure. At the beginning of each lesson, students are made aware of what they will be learning, how it relates to current knowledge, and what they will learn in future lessons. "As a teacher coaches students through the material by drawing on preexisting knowledge, the teacher presents key ideas and engages students in multiple opportunities to practice" (Farr, 2010). In the heart of the lesson, the teacher introduces new material, guided practice, and independent practice. While supporting student learning, the teacher checks for student understanding through the use of formative assessments. The lesson closes with a review of key ideas, check for understanding, and bridging to new concepts. Conceptually, students leave with clarity and understanding of the main concepts of the lesson and how to apply it to future concepts.

Prior to giving thought to how the lesson will be delivered, effective teachers envision the results expected of students. What students will know or be able to do and how will it be made

evident are questions to ask? The design of objectives can have great implication for student growth and achievement. “Strong objectives are student achievement based, measurable, and rigorous” (Farr, 2010). Designing objectives that measure up to those standards is a skill that requires great effort.

Effective teachers plan for classroom management win the same manner as academic planning. The same vision - assessment approach to student behavior is necessitated just as with lesson planning. It starts by visualizing the way in which one desires to see students working together. Once the vision is in place, one can begin to give thought the strategies that will work best toward what was envisioned. After carefully thinking about the best strategies for the desired results, a plan can then be devised. Rules are most effective when they are few in number, clear, and positive statements. “Consequences that are progressive, based on a range of interventions, flowing naturally and logically from an event or situation, and designed to maintain the dignity of students have proven to produce successful results” (Farr, 2010). Tracking and monitoring student behavior is vital to a good behavior plan.

### 3.4 Execute Effectively

Effective execution permeates through each detail of a teacher’s workday. “It means follow through on our actions, big and small, so that we are not just doing what we intend to but are actually having the effect we intend to have” (Farr, 2010). The essence of execution is when all activity contributes to the goal of student learning. “Execution is the sum of many picky details and the result of a singular, deep passion and commitment to student learning. From their smallest transition procedures, to their daily lessons, to their behavior management decisions, to their yearlong curricula path, highly effective teachers commit to and work toward achieving

desired results" (Farr, 2010). Execution is about realizing whether or not something is working, making adjustments, minimize distractions and always keep the goal at the forefront. For many teachers, the will to increase the chances of students' success outside of the classroom fuels their use of effective execution.

For any task, there are ways to complete the task and there are better ways to complete the task. Effective teachers insist on the better ways. "Teachers are called on to be great communicators, strong systems and people mangers, and excellent planners. They must have strong content area knowledge, but also know how their students effectively engage that content. They must understand grading systems, learning disabilities, learning technology, and their community's cultural norms" (Farr, 2010). Highly effective teachers strive endlessly to maximize their investment. Because of this, effective teachers are constant learners. They are always looking for new ways to improve. In addition, they practice skills they use to serve their students. Attention to detail and "dry runs" aid in maximizing effectiveness ensuring efforts are not wasted. Potential glitches are eliminated because they have been thought through and anticipated well in advance before they have an opportunity to be a distraction.

Another characteristic of effective execution is insistence on monitoring personal progress toward success. While performing key task, effective teachers track their own performance. Effective teachers work to build systems that generate and synthesize data from their classrooms. Student learning and engagement are constantly tracked. Short end of lesson assessments, student surveys, content mastery tracking systems are some of the tools used to better understand student progress. These tools allow these teachers to make meaningful

adjustments to their actions, all to impact student learning. A system of observing students is a critical part of data collection, reflection, analysis, and planning.

Sometimes the realities of circumstances in the classroom unexpectedly change. Highly effective teachers recognize the changes and make the appropriate changes in plans. In contrast, less effective teachers may stay loyal to their original plans, refusing to alter them. Reasons may include comfort of the certainty of established plans, amount of time spent on current plans, or failure to trust in themselves to make necessary adjustments. "If a teacher sticks to a plan in the midst of a changing context, students' learning is likely to suffer" (Farr, 2010). As with any undertaking, the context around teaching is often changing. The most successful teachers can quickly make modifications to meet the changes in circumstances. "Great plans foresee some of the possible challenges, but even the best plan does not foresee them all" (Farr, 2010). The comparison between circumstances imagined while planning and the circumstances during the implementation of the plan is involved in its effective execution. Good planning minimizes the manageable difference between the two scenarios.

"Strong communication is at the core of effective execution of classroom plans. Effective teachers not only communicate materials accurately to students, but the material is presented in ways that optimize students learning. These teachers define communication not as what is said but what is understood. The focus is more on student understanding than on teacher activities. "Strong communicators use a positive and engaging tone, expressive body language, varied and engaging vocal expressiveness, constant eye contact with students, repetition of key ideas, logical transitions, enthusiasm about subject matter, and visual aids and cues to clarify ideas" (Farr, 2010).

Effective executors in the classroom manage student interaction with content to be mastered. These teachers ensure that student learning is maximized by guiding and assessing student practice. Having a clear design and communication of directions is fundamental to the management of student practice. "Making sure directions are clear and understood can save a great deal of instructional time in the classroom that would otherwise be lost to redelivery and clarification" (Farr, 2010). Successful teachers never leave anything to assumption to ensure that all students are clear on what is expected of them.

"Effective teachers have developed systems and skills that answer, in real time, the question 'What are students learning?' and thus have created systems that reveal mastery of rigorous lessons" (Farr, 2010). Checking for understanding is critical to knowing whether or not students are making any sense of the material presented. This helps the teacher to know if the class can move on or whether there are some things that need clarifying. "This real time knowledge of student learning can dramatically increase the teachers' effectiveness and students' academic achievement." Checking for understanding can be done in many different ways – from standard probing questions to reading body language and facial expressions, exit slips, quick quizzes, or sharing with a neighbor. Keys to effective checking for understanding include; "maintaining focus on most important ideas, using stronger methods than 'got it'?, gauging all students' understanding, and probing beneath the surface.

Tracking progress is critical to effective execution. Tracking progress involves making a record of findings after checking for understanding so that the approach can be adjusted and progress can be celebrated. "Having data helps to make an informed decision about when material should be retaught and when to move on." A teacher's tracking system is the data

collection behind the graphs and charts" (Farr, 2010). Student and class progress is monitored through this system. Tracking allows teachers to monitor trends in each student's learning that allows for differentiation so that all students reach the big goal.

Effective teachers maximize efficiency by ensuring that time is never wasted in the classroom. These teachers utilize strategies to help students realize the value of each moment together in class. This entails the use of procedures and systems that lend themselves toward efficient learning time. Routine and organization help in ensuring efficiency. Stop watches, silent hand signals, amongst other routines are often found in productive classrooms. Routines are created when teachers turn efficient practices into habits. These set processes that students learn and perform repeatedly rarely require the intensive direction from the teacher once established. Even in the absence of the teacher, these routines continue effectively and efficiently. Routines are comforting to students and liberating for teachers. Point to remember; "Expectations have to be clear and reinforced until students meet expectations without being redirected" (Farr, 2010).

Highly effective teachers assert authority in order for students to understand expectations, the reasons behind them and consequences for not meeting them. "These teachers walk into a classroom with a mindset that *I am responsible for and in control of what happens in my classroom*" (Farr, 2010). Successful teachers do what they say they are going to do. "By setting clear expectations and following through on them, a teacher diminishes or even removes uncertainty, drama, and tension from the teacher- student relationship, thereby clearing the way for student learning. When the expectations are practiced with consistency, students' anxiety is eased of uncertainty about consequences. Inconsistency of the use of rules and consequences by the teacher will likely result in an increase in student opposition, misconduct, and interruptions.

Asserting authority does not suggest ruling a class with an iron fist, but with consistency, fairness, and dignity in your interactions with students. Assertiveness involves letting students know exactly how they are expected to behave, and what consequences will occur if expectations are not met. Being predictable gives students a sense of security and fairness. Effective teachers do not disregard misbehavior, nor do they forcefully and critically discipline a student. "These teachers simply make clear the expectations and consequences for not meeting them, provide positive reinforcement when students meet those expectations, and then uncompromisingly and methodically enforce expectations as necessary" (Farr, 2010) .

3.5 Continuously Increase Effectiveness

"Reflecting constantly on the pace of student progress toward their goals, highly effective teachers seek to improve their practice to maximize student learning" (Farr, 2010). Student data can be a great indicator of teacher effectiveness. Through data, teachers are able to pinpoint root causes of student successes and failures related to teacher actions. Once these causes are identified, solutions and learning opportunities aligned with student needs can be developed. Though effective teachers are proud of student progress, they are always seeking ways to improve. They realize that greatness is an inherently dynamic process, not an end point. "The moment you think of yourself as great, your slide toward mediocrity will have already begun" (Farr, 2010) Effective teachers are constantly challenging themselves and their students to learn, grow and improve.

Effective teaching involves the hard work of setting goals, investing students, planning purposefully, executing effectively, improving over time and relentlessly pursuing student success. Effective teaching is a learnable skill. Effective teachers view themselves as a work in

progress. “Seeing failure, mistakes, and problems as opportunities for learning is critically important” (Farr, 2010). Effective teachers persevere through unsuccessful experiences, difficult setbacks, and painful mistakes for personal learning. The inevitable mistakes are embraced as revelations of ways to improve.

Progressing in effectiveness never starts with personal biased guesses about where and how we can improve. Information rather than intuition must guide this quest. “Data gives us the map to reform. It tells us where we are, where we need to go, and who is most risk” (Farr, 2010).

Improving instructional practices is something that an effective teacher works toward and gains from experiences. It takes a concerted effort to take out time to reflect on practices and ways to improve them. Analyzing data, reflecting, and self progression are as critical to success as planning, grading, and teaching. An effective teacher adjusts practice as student and personal assessment are reflected on.

Effective teachers understand that no teacher is an island. Though one may be a competent as a teacher, there are always practices, routines, activities that can help one improve. “Effective teachers see themselves as part of a community and determine to share the benefit of that community with their students” (Farr, 2010). These teachers realize that any issue that they could encounter has already been faced by someone in their community who has gained something from that experience. Although adjustments have to be made to resources and ideas to meet a teacher’s own classroom, reinventing the wheel becomes needless. Learning from others starts with outreach. Other teachers are usually more than willing to share their resource and ideas, but they’re typically not going to knock down doors to share. It is important for teachers to recognize their own weaknesses and seek help from others. Failing to acknowledge one’s need

for help could result in not receiving very useful resources. “Effective teachers wholly reject some teachers’ notion that their classroom is a private and personal space, not to be violated by external critique” (Farr, 2010). In contrast, classrooms are viewed as learning laboratories of improvement where even the most accomplished teacher is a learner along with students.

Successful teachers employ a cycle of reflection that leads to increased effectiveness. This begins with an analysis of student progress toward the big goals. In this phase teachers asks question about what the data says about where students are and are not on pace toward the big goals and what habits are contributing most to the progress or lack of progress. “Improving effectiveness starts with digging into the data to learn where students are struggling and succeeding” (Farr, 2010). Assessment data can be thought of as a trigger for further investigation. Sources of qualitative information can be drawn on to gain a authentic sense of the nature of the progress or lack of students are experiencing. These resources can include student work, lesson plans, videotaped class sessions, notes from observers, responses to student and parent surveys, and student responses. Effective teachers use this kind of data to make adjustments in their approach.

After determining the outcome of student progress, effective teachers attempt to discern causes. Questions asked include “what teacher actions are contributing to key aspects of student performance?” and “what root cause or underlying factors are leading to those teacher actions” (Farr, 2010)? Successful teachers first search for root causes in their own actions. “Because they see themselves as ultimately responsible for what happens in their classroom, they begin with the assumption that their actions and inactions are the source of student learning or lack of learning” (Farr, 2010). A range of plausible reasons is considered before trying to delve into the most

important root cause. Once this range of reasons is discovered, root cause analysis, a simple process of asking why until the primal source of the issue is discovered, is implemented. Often, the most obvious and superficial explanation for a gap in student progress is not actually the root of the problem, so solving for the superficial cause will not have the effect we want. "Root cause analysis helps to uncover these central root issues that should be the focus of a teachers self improvement" (Farr, 2010). The possibility exist that there could be a difference between what is actually occurring in a classroom and how a teacher views what is going on in that classroom. Root cause analysis exposes these assumptions. Objective data is not always available to expose these root causes, yet evidence can be sought out to confirm theories. After identifying teachers' contribution to students' lack of progress, decisions have to be about whether to move to seek answers or to delve further into why the teacher may be contributing to the lack of progress by students. Are more skills or knowledge needed? Do personal mindsets need to be challenged? Through honest examination of qualitative and quantitative data and reflection, these questions can be answered.

After identifying the causes for student achievement or lack of student achievement, teachers can then identity and implement solutions that address the root causes for gaps in progress. Questions to be answered include; "What learning experiences will help me meet my key objectives for addressing the root causes I have identified? How will I change my behavior in light of the learning experiences to change student outcomes? How will I know that those learning experiences have successfully led to improvement? Highly effective teachers use data to search for root causes of student lack of achievement, and make informed decisions about which resources will be most beneficial to student learning. "Sometimes finding solutions requires little effort beyond identifying the root causes of the problem. Other times, identifying root causes of

prioritized problems will raise questions for which you need additional resources" (Farr, 2010). Ultimately, for the purpose of increasing student learning, effective teachers change their own behavior.

### 3.6 Work Relentlessly

Effective teachers take full responsibility for student learning, even when exceeding traditional expectation is required. To accomplish this, these teachers use creativity to overcome almost insurmountable difficulties, maximize time and resources for optimal benefit, and continue these efforts long term. The whole approach taken to classroom leadership from this type of teacher is embodied in a conviction that their students' success or failure is in the hand of the teacher. Whereas, some teachers may focus solely on the conditions surrounding student learning experiences, effective teachers respond by not making excuses or forfeiting to failure but navigating through the challenges to ensure success. "A teacher can control enough factors in a student's life to close the achievement gap" (Farr, 2010). When teachers focus on what they can control, they are able to change the academic trajectory of their students." A teacher can ensure that students realize that effort does lead to success. A teacher can ensure that classroom instruction is efficient, effective, and engaging; that time available for learning increases; that distraction from learning decreases; and that within the four walls of the classroom, students feel safe, welcomed, and encouraged to take academic risks" (Farr, 2010). Getting this done requires a relentless approach that doesn't rest until the goal is reached.

One key element of working relentlessly is persistence. Teaching in a low performing school has many challenges. Persistent teachers push through obstacles and challenges that pose a hazard to their vision for success. Failure is not accepted.

Maintaining high expectations, even in the face of harsh and difficult realities is critical to being relentless. "There are circumstances that arise that make it easy for teachers to make excuses for student underperformance and lend themselves to kind hearted reactions that would degrade high expectations for students" (Farr, 2010). This can sometimes have the effect of assuming that students are completely incapable of achieving any sustainable success. Effective teachers defy the idea of compromising expectations. The realities these teachers face can be daunting. Some succumb to lowering expectations and teaching only the basics, while others find a way to weave the basics into a challenging curriculum. Uncompromising yet vigilant denial of excuses for student failure is like a mantra for effective teachers. Incorporating literacy instruction across all content areas is a strategy proven effective in schools that serve the poor. In these situations, many times students enter a class behind in their mastery of the previous year's standards. Less effective teachers handle this by setting a lower learning pace for them. Although the students are behind, many will have the capacity and potential for great growth. This will be a great opportunity to accelerate learning and pacing. An excellent way of pacing a classroom is doing so in light of a classroom's pace in a high performing school. Students in these high performance schools can be used as benchmarks for pacing and progress.

Time and resources are usually rare especially when dealing with students that are academically behind in low performing schools. Effective teachers relentlessly make the most of the time and resources allotted for instruction. To maximize student learning, these teachers create and stretch time and resources. Every possible moment is used to impact learning. Organizing lunch study sessions, helping students during planning time, holding group study sessions after school, and even tutoring on weekends are all activities used to optimize student learning. Books, school supplies and other resources are frequently in short supply which

contributes to lack of student achievement in many low income classrooms. This sometimes requires creativity on the part of teachers to obtain needed resources. Schools building relationships with individuals, corporations, and different organizations to secure much needed resources can prove beneficial. Applying for grants and online donor sources can also be an avenue to get needed resources to increase student achievement.

"Highly effective teachers broaden their influence on problems inhibiting student learning" (Farr, 2010). These teachers view the role of teaching from an extensive viewpoint. This can sometimes mean doing whatever is necessary to reach the ambitious goals set for students. Mentor, colleague, administrator, activist, student, and friend are the roles sometimes taken on in addition to being an educator. Each role is significantly important in meeting the goal of closing the achievement gap. Also critical to expanding one's influence is the ability to influence the actions of others in the school or community. Credibility is first earned in one's own classroom. Others outside of a teacher's own classroom are more prone to listen to someone who has proven their leadership capabilities in their own classroom with exceptional student progress. "Qualities of humility and respect aid in developing relationships with colleagues and administrators in order to collaborate for the sake of their students" (Farr, 2010). These relationships are critical to sharing and gaining knowledge and skills about subject content, pedagogy, access to resources and working within the system of a school, district, or community. Void of the support of colleagues, one's influence can be greatly reduced if not totally eradicated.

"While the word relentless denotes a purpose driven intensity, it also captures the long term persistence demonstrated by highly effective teachers as they work for their students" (Farr,

2010). Relentless efforts sustained over time produce the results of meeting the big goals. A burned out teacher can provide little to help students. Teachers are most effective when they're full of energy, fulfilled, and focused. These qualities are not optimal when teachers are fatigued and overworked. Teachers that consciously manage their own energy levels by taking care of themselves and drawing energy from the inspiration inherent in leading children to academic success minimize exhaustion.

Education has been called the great equalizer, a means of upward mobility for all children regardless of race, economic status, or geography. Yet, the most accurate predictors of student achievement and opportunity in our country today are often race, economic status, and geography. In many ways, our educational system undermines, suppresses and denies the potential of millions of children living in poverty. Because of this, the achievement gap between the affluent and the poor continues to widen. Recognizing these realities, effective teachers fight the injustice of the achievement gap. Perceiving the potential of their students, these teachers believe that their students can achieve academic success. Like successful leaders in a difficult context, these teachers are working relentlessly at setting big goals, planning purposefully, investing their students and their families, and executing effectively.

# CHAPTER 4: UNIVERSITY SUPPORT

There are multiple ways that colleges and universities can be instrumental in raising the level of instruction and learning in low performing grade schools serving the poorest students in America. They can assist with writing or modifying curricula, providing business management services, strengthening teachers' pedagogy and content knowledge through professional development, offering student tutors and mentors, and playing a vital role in school reform plans. Many universities are already playing a significant role in low performing public schools that serve the poor. A student at Johns Hopkins University in Baltimore founded *Teach Baltimore* in 1992 through the university's Office of Volunteer Services. The program is a summer academic program that recruits and trains college students to teach an eight week, intensive academic program to students in small settings. The focus of the program is on students in high poverty, low performing schools. The program has also developed a relationship with Johns Hopkins' Department of Education and the city of Baltimore's personnel office to offer summer tutors a professional development program that would give them the opportunity to earn their teaching certification and a master's degree while teaching in the Baltimore public school system.

Other universities have developed school improvement programs that have been duplicated across the nation. James Comer of Yale University created *The School Development Plan (SDP)* that has been implemented in over 600 schools. The SDP is a research-based, comprehensive K-12 education reform program grounded in the principles of child, adolescent, and adult development. The SDP offers managerial and infrastructural support for rallying teachers, administrators, and parents, in order to help build students' personal, social, and academic development and achievement. The program is based on the idea "it takes a village to raise a child", reinforcing the necessity of involvement from the entire school community to help

children succeed. This program intends to create learning environments that support the many aspects of the development of children and advocates consensus and collaboration in school government; see http://medicine.yale.edu/childstudy/comer/

Stanford University developed *Accelerated Schools*. This program promotes the idea that all children are capable of learning. The program was designed to create success for at risks students and help close the achievement gap. In addition, it advocates that at risk students need accelerated learning opposed to remediation. The plan is to drastically change individual schools by redesigning and integrating curricular, instructional, and organizational practices to provide meaningful enrichment. The program involves restructuring the schools' organization, curriculum and instruction. A primary goal of the program is for all students, by the sixth grade to meet their academic, social, and physical potential and perform at grade level. The program has been replicated in over 700 schools; see http://www.funderstanding.com/content/accelerated-schools.

Brown university has developed The *Coalition of Essential Schools (CES)*, a network of over 1,000 schools. CES has been at the forefront of creating and maintaining individualized, equitable, and academically challenging schools. The focus of this coalition is on students' ability to demonstrate mastery of essential skills. CES works with educators to encourage and sustain innovative and effective instruction by training for cultures of continuous development and powerful professional learning communities centered on student learning. CES works with school districts and other entities to shape policy conditions that support student achievement. The proponents of CES believe that schools should establish clear goals and standards for all students but differentiate for individual learning and focus on a limited number of essential

skills. Part of the organizing philosophy uses the metaphor of teachers as "coaches" and students as "workers;" see http://www.essentialschools.org/items and

At LSU, there are several programs within the College of Education and the Cain Center for STEM literacy that specifically target high need high poverty schools. The College of Education sponsors *GEAR UP*, a proactive partnership with school systems and community organizations addressing the issues of middle and high school retention, graduation and success in postsecondary education and careers. The program is designed to ensure that the students, their families and their teachers receive the services aimed at college-readiness and access provided by GEAR UP. The goals for the program are to increase the academic performance and preparation for postsecondary education for GEAR UP students, increase the rate of high school graduation and participation in postsecondary education for GEAR UP students, and to increase GEAR UP students' and their families' knowledge of postsecondary options, preparation and financing. *Louisiana State Youth Opportunities Unlimited (LSYOU)* is a program in the LSU College of Education that helps students succeed in high school. The program serves as an outreach to the community, a service learning site to the LSU faculty and students, and a place where students from the College of Education can learn effective teaching techniques.

The LSU Cain Center for STEM literacy has two large scale projects that specifically target high need high poverty schools. *The Pilot Professional Development Project (PPDP)* and *the Baker Project*. These two projects will be discussed in more detail.

4.1 Teacher Leader Endorsement/ Degree Programs

The need for true teacher leadership for schools in "crisis" is tremendous. Many teachers aspire to more effectively serve their students and lead them to academic success but lack the necessary

skills to produce the desired results. In many ways, traditional teacher preparation programs fail to equip prospective teachers to meet the needs of students in high poverty schools.

A teacher leader degree or endorsement program that focuses on developing teachers with the aforementioned skills would be an enormous benefit to students in high poverty schools across the United States. An endorsement program, through a university, would support teacher leaders by building on content knowledge, instructional practices, child development and teacher needs. Using the knowledge gained, teacher leaders would be able to mentor and coach new teachers, develop and deliver professional opportunities, develop curriculum, lead school improvement initiatives, serve as department and grade level chairs, serve on school leadership teams, and collect, analyze and interpret data.

The inability of many schools to meet the academic needs of our country's poorest necessitate training professional agents of change for these underperforming schools. Within existing graduate programs innovative instructional approaches would reflect a convergence of best insights from "real world" school experiences and relevant university research pertaining to schools. Those receiving this training will concurrently serve as instructional coaches in targeted school settings. This approach reflects a paradigm shift with broad implications for the preparation of school leaders.

The framework would include four graduate level courses within the parameters of the graduate degree that could be used for an add-on endorsement. The mechanism would be two intensive institute courses in a summer followed by a school improvement course the following fall semester, followed up with an internship type course each spring. For those teachers who already possess a master's degree, the process would generate the knowledge base in a crucial,

shorter period of time. The teachers who do not already have the advanced degree and want to pursue one will have the critical material of endorsement immediately, but can take the remainder of the coursework for the full graduate degree over a longer period of time.

Both SUBR and LSU have existing coursework within degree programs that can be used for an add-on certificate. LSU has options within the Masters of Arts in Education that might be used for the specific courses developed for a teacher leader program. SUBR is in the process of evaluating and revising programs although the direction of their degree is not clear at this point. However, members of both faculties are collaborating on the courses so that there is the flexibility to teach the courses in either setting, circumstances permitting. Because of the extensive and immediate needs in many low performing schools, it is possible that these needs would best be met through coursework that would lead to an add-on endorsement in teacher leadership. Such an endorsement would fit as a subset of the Masters of Arts in Education, allowing someone to get the certification in a short timeframe and then elect to pursue more extensive study for the degree with an emphasis in instructional leadership, if desired.

Currently, Louisiana as well as a number of other states recognizes teacher leader endorsements. Louisiana offers this optional endorsement that allows principals the opportunity to afford experiences to teachers at the school level and recruit potential educational leader candidates for their district. Teachers that fill school site leadership roles or desire to, would be likely candidates for this endorsement. This endorsement is valid for five years and is renewable every five years based upon successful completion and verification of 150 continuing learning units of professional development consistent with the Individual Professional Growth Plan (IPGP) over a five-year time period. To become eligible, prospective teachers must;

1. Posses a valid Type B, Level 2, or higher Louisiana teaching certificate;

2. Completion of a state-approved teacher leader program that requires, at minimum, the equivalent of six graduate hours, or 90 contact hours, including a combination of face-to-face and field-based professional development activities that:

   A. May include the use of a cohort approach;

   B. Provides support from and monitoring by current outstanding administrators serving as mentors and/or facilitators;

   C. Includes an electronic component (online and/or compressed video) to ensure each participant's access to key resources and to build a statewide network of qualified administrator candidates that could include the development of cohorts; and

   D. Requires the development and presentation of a culminating portfolio that provides evidence that knowledge gained and skills acquired are aligned with national and state leader standards. see (http://www.doa.louisiana.gov/osr/lac/28v131/28v131.doc)

Presently, the LSU Cain Center and faculty from the Department of Mathematics and the College of Education are collaborating to create a teacher leader endorsement as mentioned above. The framework for this endorsement project is provided by the following professional development project.

4.2 Pilot Professional Development Project

In 2009, the LaSIP Council, policy-making body for the Louisiana Systemic Initiatives Program (LaSIP), authorized the funding for pilot professional development (PD) projects for schools entering in 2009 into the Recovery School District-North (RSD- North) as charter schools, schools under a Memorandum of Understanding (MOU), or schools under the direct management of the RSD-North. The projects were to be funded up to three years with the second- and third-year funding being contingent upon annual external reviews. Thirty- three schools were eligible to apply for the funding as authorized by the LaSIP Council.

Strongly supported by Commissioner of Higher Education Sally Clausen and Louisiana State Superintendent of Education Paul Pastorek, this pilot professional development project

(PPDP) was designed to help the designated underperforming schools accomplish goals identified in their School Improvement Plan (SIP) or School Progress Plan (SPP) required by the Louisiana Department of Education (LDE) and RSD-North. Specifically, the PPDP provided professional development that promotes systemic transformations for targeted schools. The program required funded schools to collaborate with one or more colleges or universities; enhance the core content and pedagogical knowledge of teachers in mathematics, science, and/or English language arts; and ultimately to improve student achievement on the iLEAP, LEAP, and GEE State tests. Furthermore, this project was intended to be sustainable and continue to positively impact schools for many years to come. Proposals were submitted on behalf of the following five (5) schools:

- Dalton Elementary, East Baton Rouge Parish
- Lanier Elementary, East Baton Rouge Parish
- St. Helena Central Elementary, St. Helena Parish
- St. Helena Central Middle, St. Helena Parish
- Romeville Elementary, St. James Parish

Before going into the details of the proposals, it is necessary to provide some basic data describing the academic conditions and challenges at these five schools.

Romeville Elementary School is located on the outskirts of St. James Parish along the Mississippi River in the middle of sugar canes fields and industry. The school structure which is

forty three years old has gone through numerous transitions. Today students from pre-kindergarten through sixth grade students are educated at this site. Romeville has a 99.9% African American population with 100% receiving free or reduced lunch. The 2000 census data indicate that 33.3% of the community at large has not obtained a high school diploma and 53% of households are below the poverty line.

Romeville LEAP and iLEAP Scores

Table 4.1 Romeville 3rd Grade iLEAP Results

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2009 | 0 | 5 | 36 | 32 | 27 | 41% |
| 2008 | 0 | 0 | 63 | 13 | 25 | 62% |
| 2007 | 0 | 5 | 14 | 24 | 57 | 19% |
| 2006 | 0 | 0 | 36 | 32 | 32 | 36% |

Table 4.2 Romeville 4th Grade iLEAP Results

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2009 | 0 | 0 | 35 | 20 | 45 | 35% |
| 2008 | 0 | 3 | 26 | 32 | 39 | 29% |
| 2007 | 0 | 0 | 33 | 23 | 43 | 33% |
| 2006 | 0 | 0 | 35 | 43 | 22 | 35% |

Table 4.3 Romeville5th Grade iLEAP Results

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2009 | 0 | 6 | 44 | 33 | 17 | 50% |
| 2008 | 0 | 0 | 62 | 15 | 23 | 62% |
| 2007 | 0 | 0 | 41 | 32 | 27 | 41% |
| 2006 | 0 | 0 | 13 | 47 | 40 | 36% |

Table 4.4 Romeville 6th Grade iLEAP Results

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2009 | 0 | 8 | 83 | 0 | 8 | 92% |
| 2008 | 0 | 0 | 69 | 31 | 0 | 69% |
| 2007 | 0 | 0 | 10 | 24 | 67 | 10% |
| 2006 | 0 | 0 | 29 | 14 | 57 | 29% |

Table 4.5 Overall % of Proficient 3rd -6th grade Romeville Students (Advanced, Mastery and Basic)

| 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|
| 35% | 27% | 33% | 51% |

Dalton and Lanier Elementary Schools are inner city schools located in the north central part of Baton Rouge. Each serves approximately 300 regular and special education students from pre-kindergarten through fifth grade. The majority of the students live in a single parent, female lead households usually with limited education. Roughly 99% of the students at both Dalton and

Lanier receive free or reduced lunch. Both Dalton and Lanier were placed in the Recovery School District in 2008 after years of failing performance and being labeled Academically Unacceptable Schools. Although, some small gains have been in each School's performance score, in 2008, more than 62% of fourth graders at each school failed to reach proficiency in mathematics. To add to an already challenging scenario, Advance Baton Rouge, which was awarded a charter to manage Dalton and Lanier, was faced with having to completely re-staff each school.

**Table 4.6 Dalton 3rd Grade iLEAP Results**

| Year 2010 | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 0 | 0 | 34 | 15 | 51 | 34% |
| 2009 | 2 | 9 | 26 | 21 | 43 | 37% |
| 2008 | 0 | 8 | 25 | 29 | 38 | 33% |
| 2007 | 0 | 4 | 26 | 39 | 31 | 30% |
| 2006 | 0 | 2 | 24 | 31 | 43 | 26% |

**Table 4.7 Dalton 4th Grade LEAP Results**

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 0 | 2 | 27 | 27 | 44 | 29% |
| 2009 3rd | 0 | 0 | 34 | 37 | 29 | 34% |
| 2008 | 0 | 5 | 33 | 33 | 29 | 38% |
| 2007 | 0 | 2 | 20 | 31 | 47 | 22% |
| 2006 3rd | 0 | 0 | 18 | 32 | 51 | 18% |

**Table 4.8 Dalton 5th Grade iLEAP Results**

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 0 | 9 | 26 | 17 | 49 | 35% |
| 2009 3rd | 3 | 9 | 34 | 20 | 34 | 46% |
| 2008 | 0 | 0 | 36 | 23 | 40 | 36% |
| 2007 | 0 | 3 | 28 | 32 | 37 | 31% |
| 2006 3rd | 0 | 5 | 38 | 19 | 38 | 43% |

**Table 4.9 Lanier 3rd Grade iLEAP Results**

| Year 3rd Grade iLEAP | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 2 | 0 | 17 | 45 | 36 | 19% |
| 2009 | 0 | 2 | 26 | 19 | 53 | 28% |
| 2008 | 0 | 0 | 28 | 21 | 51 | 28% |
| 2007 | 0 | 2 | 33 | 19 | 46 | 35% |
| 2006 | 0 | 2 | 41 | 32 | 25 | 43% |

**Table 4.10 Lanier 4th Grade LEAP Results**

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 0 | 2 | 17 | 28 | 53 | 19% |
| 2009 | 0 | 2 | 39 | 31 | 29 | 41% |
| 2008 | 0 | 8 | 25 | 39 | 27 | 33% |
| 2007 | 0 | 0 | 18 | 22 | 60 | 18% |
| 2006 | 0 | 3 | 20 | 34 | 43 | 23% |

**Table 4.11 Lanier 5$^{th}$ Grade iLEAP Results**

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 0 | 4 | 20 | 36 | 40 | 24% |
| 2009 | 0 | 0 | 43 | 35 | 22 | 43% |
| 2008 | 0 | 0 | 38 | 9 | 53 | 38% |
| 2007 | 0 | 8 | 26 | 37 | 29 | 36% |
| 2006 | 0 | 4 | 35 | 36 | 25 | 39% |

St Helena Elementary and Middle

St. Helena Elementary and St. Helena Middle are both located in Greensburg, a rural town in southeastern Louisiana. The area has been plagued by poverty, as 3 out of 4 residents live below the poverty line. 96% of the student population at both schools receive free or reduced lunch.The schools system has been suffering from lack of funding which has drastically impacted the quality of education it could produce. As a result, it has had to deal with low teacher salaries, low number of highly qualified teachers, and dismal state standardized test results. The St. Helena School district was taken over by the state in the fall of 2010 as a result of chronically low academic performance.

Table 4.12 St. Helena 3rd Grade iLEAP Results

| | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 0 | 4 | 30 | 18 | 49 | 34% |
| 2009 | 0 | 5 | 32 | 25 | 38 | 37% |
| 2008 | 0 | 2 | 26 | 22 | 50 | 28% |
| 2007 | 0 | 3 | 28 | 39 | 30 | 31% |
| 2006 | 1 | 3 | 28 | 24 | 45 | 32% |

Table 4.13 St. Helena 5th Grade iLEAP Results

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 1 | 2 | 30 | 13 | 54 | 33% |
| 2009 | 0 | 0 | 25 | 19 | 56 | 25% |
| 2008 | 0 | 0 | 18 | 24 | 58 | 18% |
| 2007 | 0 | 0 | 13 | 17 | 70 | 13% |
| 2006 | 1 | 1 | 22 | 23 | 52 | 24% |

Table 4.14 St. Helena 4th Grade LEAP Results

| | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 0 | 4 | 27 | 33 | 36 | 31% |
| 2009 | 0 | 0 | 62 | 19 | 19 | 62% |
| 2008 | 0 | 4 | 29 | 29 | 37 | 33% |
| 2007 | 0 | 4 | 44 | 28 | 25 | 48% |
| 2006 | 0 | 4 | 19 | 26 | 50 | 23% |

Table 4.15 St. Helena 8th Grade LEAP

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 0 | 4 | 20 | 28 | 48 | 24% |
| 2009 | 1 | 1 | 33 | 31 | 33 | 35% |
| 2008 | 0 | 1 | 29 | 27 | 43 | 30% |
| 2007 | 0 | 1 | 28 | 29 | 43 | 29% |
| 2006 | 0 | 0 | 10 | 28 | 63 | 10% |

These proposals included two universities as collaborators – Louisiana State University and A&M College in Baton Rouge and Southern University at Baton Rouge. The proposed plan envisioned a mechanism for broadening reform efforts while achieving economies of scale through the development of a degree program to train specialists for service in the participating schools. Because the proposals overlapped in crucial areas and each demonstrated extreme needs, the schools and universities requested consideration of a coordinated initiative that would embrace all five schools.

Given the similarities among the submitted proposals and the clear need for instructional aid at all the submitting schools, funding four core activities at all submitting schools and universities was recommended. A professional degree program supporting the instructional needs of academically challenged schools was set be designed within the structural parameters of existing degree programs at LSU and SUBR, to be implemented by the participating universities and with significant input from the participating schools. This degree program would include content combined with other educational components necessary to coach teachers to be more effective in the classroom. These components include, but are not limited to, behavioral management, school culture, raising levels of expectations, alternative assessments, differentiated instruction and the use of technology as an instructional tool. Each school would aggressively leverage non-grant resources to further initiatives funded through the grant consistent with SIPs or SPPs. Universities will host semi-monthly seminars for instructional coaches which will include continuing professional development, sharing of best practices, and discussions related to the development of the professional degree program. An instructional coach for each school would be supported with PPDP funds to provide onsite services,

participate in and/or deliver professional development to teaching staff, and attend semi-monthly seminars at the partnering universities.

Participating schools and universities would establish mechanisms for partnership to ensure that school personnel receive appropriate professional development, and the universities receive sufficient participation in the development of the professional degree program related to instructional coaching. Both during conceptualization and implementation, LSU and SUBR will identify best concepts and best practices which will become common features of the collaborative program.

Recommendations were also made on activities to be included in the school year. Participating schools and universities would schedule school site visits within the "cohort" throughout the year. These visits would be focused on instruction and the sharing of best practices, while at the same time giving feedback to the host school. Participating schools were also encouraged to conduct off-site observations at high performing schools within the state of Louisiana and use the information that is appropriate to enhance their respective instructional programs. Beginning the year with a summer retreat to bring all instructional coaches together to exchange ideas and create a professional learning community was also suggested. A winter retreat in January was recommended to conduct formative assessments. The use of electronic blackboards to facilitate discussion and address needs as they arise throughout the school year would enhance communication. Participants and school leaders are encouraged to engage parents and the broader community to become involved in the new school programs and educational initiatives.

The initial meeting of PPDP staff from LSU and SU was held July 2, 2009, wherein participants discussed focus on training current and prospective educational leaders to implement

academic interventions on a school level and targeted teachers interested in becoming specialists in educational interventions aimed at restructuring schools. Existing coursework at both LSU and SUBR was considered but focus was also necessitated on the needs of the PDPP participants and what was important to them.

By August, PPDP grant staff had reviewed literature on turn around schools and identified 5elements of great schools: deep content knowledge and teaching, great pedagogy, organization, teaming, and support. During during the fall of 2009, PPDP participants and grant staff visited 3 local turn around schools, Highland Elementary East Baton Rouge Parish Schools (EBRPSS), Ryan Elementary (EBRPSS) and Iberville Middle School, Iberville Parish. In a follow up meeting participants, coaches, principals, and superintendents, provided detailed feedback on what they had observed at day long school visits regarding *positive* turn-around practices. Common to all three groups were the following elements: leadership skill, communication skill, skill sets specific to communicating with adult learners, team building, creating community, developing a "whatever it takes" attitude, trust, building common vision, coaching strategies, time management (instruction & coaches), data analysis and application, identification, understanding of and implementation of best practices in high performing turn-around schools. Participants and grant staff also read Jim Knight's *Instructional Coaching* (2007). Through phone conferences, grant staff facilitated discussion of the book with coach participants. PPDP staff also attended a LaSIP Council meeting and provided a report, identifying next steps as scrutinizing existing programs and developing an add-on certificate for Teacher leadership in Turn-around Schools.

Using information gained from the literature review and feedback from PPDP participants, PPDP grant faculty at LSU took the lead, developed a 12 hour Add-On Teacher

Leadership For Turn-Around Schools Certificate designed to assist with the development of instructionally-focused schools (bell-to-bell teaching) with shared leadership, pilot professional development project strong teacher collaboration, sophisticated use of data beyond collection and reporting, and positive, child-centered attitudes and practices. This certificate contains a mix of innovative coursework and existing coursework, creating a hybrid add-on certificate specifically targeting those individuals who wish such an add-on in the area of Teacher Leadership For Turn-Around Schools. Six hours were newly created and offered summer of 2010 with the remaining 6 hours split across fall 2010 and spring 2011semesters.

Dr. Dana L. Bickmore and Dr. Dianne Taylor, Educational Leadership Program at LSU, met with PDPP Grant staff and agreed to collaborate to make the add-on certificate in teacher leadership with an emphasis in instructional teacher leadership for turn-around schools a possibility. To that end, once students have completed this 12 hours for the add-on teacher leadership certificate, Drs. Bickmore and Taylor have agreed to substitute 6 hours earned in EDCI 5880, 1 and EDCI 5880, 2 for anyone desiring to further their graduate work and pursue a MA in Educational Administration. In effect, completing this add-on certificate will enable interested student to opt to complete either a MA in Educational Leadership or and MA in Curriculum & Instruction with 12 hours earned. Typically, masters programs contain 36 hours; completing this add on certificate in teacher leadership signified 1/3 of the required hours for a typical masters degree.

Similarity of programming at SUBR and reciprocal agreements between institutions makes this extremely accessible to those who wish to pursue. The existence of similar programs at other Louisiana universities (28 degree programs in educational administration as per redesign) also makes thus add –on certificate possible state-wide.

Teacher Leadership For Turn-Around Schools Add-on Certificate Program

1) EDCI 5880, section I (Co-requisite: EDCI 5880, section II)

*Special Topics in Education: Advancing Teacher Leadership Institute*

Summer 2010, special session

Meets June 28-July 9, M-F *and* July 20, 21, 22; 2.3 weeks; 3 hours daily; 1:30-4:30 M-F

2) EDCI 5880, section II (Co-requisite: EDCI 5880, section I )

*Special Topics in Education: Promoting Instructional Coaching Institute*

Summer 2010, special session

Meets June 28-July 9, M-F *and* July 20, 21, 22; 2.3 weeks; 3 hours daily; 9:30-12:30 M-F

3) ELRC 7422, *School Improvement and Research* (fall 2010)

4) ELRC 7404, *Internship* (in spring 2011)

For the time and resources allocated, great progress was made toward the major focus of the project of synergistic effort to train professional agents of change for underperforming schools. It should also be noted that each school has unique, specific needs that would require more resources to address in depth. While all five sites desired direction about best practices to turnaround schools, they were very diverse in their identifications of particular needs. Each school definitely wanted to implement change mechanisms that would improve school performance and student achievement but found it difficult to identify unifying specific needs that could be addressed as a group. There is no cookie-cutter response to such diverse needs. There were different content issues for some schools and different phases of implementing basic operational structures for other schools. Also, the job responsibilities of the coaches varied widely. Within the confines of the resources available, it was sometimes difficult to address needs of a specific topic for one school when other schools did not have that same need or to

give strategies for structuring the coaching when not all districts had the same guidelines. Additionally, the number of coaches and the areas of focus were not uniform, nor were their expertise and experience levels. The structure of the project allowed greatly needed flexibility to respond to the diverse needs of all five schools as already mentioned.

Another challenge experienced was the different structures of the school districts and their needs to make changes according to their guidelines or circumstances. For example, job descriptions for the same positions varied from district to district; two out of five principals were changed during the year; and two of the coaching positions were not filled until mid to late fall and after that a second change was made with one of the positions. This impeded full participation in grant activities. Also, hiring coaches was not consistently approached. Coach backgrounds varied tremendously as did their job load and requirements.

Each school faced significant obstacles which impacted results in student achievement that were not anticipated at the outset of the collaboration. Romeville Elementary had only one section of each grade level. The 2009-10 third grade class had some of the lowest performing students in its history. Fifty percent of the students in that grade level were classified as non-readers and 43% were classified as special education students. Similar statistics were indicative of the fourth grade class. Standardized scores in both grade levels showed that a large number of students had growth in scaled scores from 100 points to over 200 points, showing great improvement and doubling the scores, yet this was still classified in the "unsatisfactory" range by percentage scores. If this growth can be sustained in future years, these children have a chance to succeed. (4th grade LEAP - % basic and above: 35% in ELA, 29% in Math)

Lanier Elementary was completely reconstituted. The student population had a 75% turnover. ALL teachers were first year teachers and most were Teach for America (TFA)

teachers. That is, not even one teacher had ever been in charge of a classroom prior to the 2009-10 year. The principal was replaced during the first semester. There was no institutional knowledge of how a school should function and a school culture had to be created. (4th grade LEAP - % basic and above: 21% in ELA, 19% in Math)

St. Helena School District has a critical staffing dilemma with surrounding districts paying an average of approximately $12,000 more annually. The elementary school had three principals from the beginning of the summer until the Christmas holidays. The school shifted from departmentalized to self-contained classrooms. Teacher turnover was extremely high as well. The superintendent is in the process of appealing through the court system to remedy the funding formulas. (4th grade LEAP - % basic and above: suspected breach in security for ELA, 31% in Math)

Similarly, St. Helena Middle School lost four ELA teachers in one grade level within a month. It was another month with uncertified and untrained substitutes in classrooms until permanent teachers could be hired. In addition, the principal was removed and St. Helena Middle was identified in March for takeover by RSD. This was publically announced and greatly impacted morale and staff efforts at the school right before testing. (8th grade LEAP - % basic and above: 23% in ELA, 24% in Math)

Test scores are important and should improve in these schools. However, the previously described circumstances present great challenges to the goal of high academic performance. There is a much larger perspective needed for a complete portrait of any school. Turn-around can happen, but in the midst of instability such as late hirings, changing principals, and announcing "take-over" status, performance is impacted. The goal of this project was to indirectly impact students by directly impacting their teachers. It took at least a semester for most of the coaches to

get oriented to their jobs and to impact the instruction at the schools. Finally, it is my opinion that these types of programs (turn-around) take time, at least two to three years according to research. Stable faculty, stable school administration and stability of instruction are needed and warranted.

The most effective components of the project seemed to be the visits to the high functioning schools where each of the project schools could be looking for aspects they needed most, and the opportunities to come together, discuss, and reflect on new knowledge. The university resources partners can perhaps be used most effectively in what the university does best and has authority to do in offering a variety of course options to address school needs. What can be done differently in the way the universities approach that task is to design programs from the teachers' perspectives that actually meet those needs and appeal to cohort groups who have similar interests. From teacher input, LSU has recently focused a Masters of Natural Science professional degree to assist middle and high school teachers in content development and is currently investigating creation of a parallel degree for elementary teachers. The PPDP LaSIP grant has afforded further opportunity for LSU and SU to refocus and redesign other existing degrees to meet critical needs for teacher leadership and to create a special endorsement for teacher leaders to assist in turning around struggling schools. 18 Schools gave input on what skills are needed in a "real world" situation to help them implement changes that would affect operation and student achievement. In addition, they gave direction on how that should occur. They indicated that "time is of the essence" to affect student achievement and consequently the coursework needs to be compact in offering critical pieces in a short time frame. The structure of two intense courses in the summer offered in a condensed period followed by a semester spent

on a school improvement and research course and then practice in the form of an "internship" emerged.

Based on the results of the current year's program and feedback from the participants, future activities have been identified that will be focused on both the short-term and long-term objectives. The coursework necessary for the Teacher Leader endorsement (short-term) leading to a masters degree in instructional leadership for turnaround (long-term) should be planned according to the guidelines and within the existing degree structures identified at both Southern University and LSU. Support for the participating teachers from the five project schools who wish to obtain this endorsement as first and second cohorts should be funded at least for the remainder of the PPDP grant to allow the program to become self-sustaining at both universities. It is further recommended that the professional development for project coaches shift to the coursework that will be offered in the add-on endorsement program designed to take place in the summer with internship experiences to be completed during the school year. The schools and districts will be encouraged to continue work with their school improvement plans that will support their content coaches in their work with the teachers of the five participating schools. To accomplish this end, the IHEs will be available for consultation with the participating schools and districts on a needs basis.

4.4 Baker Project

The Baker School District is in a poor, working class area outlying urban Baton Rouge. According to the 2008-2009 Louisiana State Education Progress Report, Baker includes five schools with a total of 1,842 students, of whom 92.7% are African-American with 84.6% of the students eligible for free/reduced lunch. On the 4th grade LEAP math test (Louisiana's high stakes test) for 2008-2009, only 38% of the students achieved the promotion standard of

proficient by scoring ``basic and above'' compared to 64% of 4th grade students statewide. In fact, the percentage of students in this district that scored unsatisfactory is one of the highest percentages among all districts in the state of Louisiana. Percentages for the 8th grade LEAP math tests and the Graduate Exit Examination were equally distressing. The City of Baker School System typically ranks in the bottom 3 percent of all Louisiana school systems.

Table 4.16 Baker 3rd Grade iLEAP

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 1 | 3 | 25 | 27 | 44 | 29 |
| 2009 | 3 | 7 | 29 | 26 | 36 | 39 |
| 2008 | 4 | 1 | 33 | 19 | 28 | 53 |
| 2007 | 1 | 4 | 29 | 33 | 33 | 34 |
| 2006 | 0 | 0 | 27 | 32 | 40 | 27 |

Table 4.17 Baker 4th Grade iLEAP

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 1 | 6 | 36 | 22 | 35 | 43 |
| 2009 | 1 | 4 | 33 | 32 | 31 | 38 |
| 2008 | 1 | 3 | 27 | 25 | 45 | 31 |
| 2007 | 0 | 2 | 27 | 30 | 40 | 29 |
| 2006 | 0 | 0 | 30 | 35 | 35 | 30 |

Table 4.18 Baker 5th Grade iLEAP

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 1 | 6 | 29 | 28 | 36 | 36 |
| 2009 | 1 | 1 | 35 | 30 | 34 | 37 |
| 2008 | 1 | 1 | 38 | 24 | 36 | 40 |
| 2007 | 0 | 4 | 27 | 22 | 47 | 31 |
| 2006 | 1 | 3 | 36 | 28 | 32 | 40 |

Table 4.19 Baker 8th Grade LEAP

| Year | A | M | B | AB | U | Proficient |
|---|---|---|---|---|---|---|
| 2010 | 1 | 2 | 24 | 38 | 36 | 27 |
| 2009 | 1 | 4 | 33 | 32 | 31 | 38 |
| 2008 | 0 | 0 | 34 | 39 | 28 | 34 |
| 2007 | 0 | 2 | 26 | 28 | 44 | 28 |
| 2006 | 0 | 0 | 19 | 40 | 29 | 19 |

The district has one of the lowest percentages in the state for the number of core classes taught by highly qualified teachers at 64%. The state average is 86%. There is significant teacher turnover from year to year and even during the school year. In fact, the large turnover in teachers creates a need to address ways to integrate new teachers into the project on a continuing basis.

Public schools in the state of Louisiana follow the state comprehensive curriculum or an variation of it. Because of the urgency of the need to improve student achievement in the Baker system, the school system was given permission by the state to try alternatives to the state curriculum. Through a partnership with local universities, the Baker school system adopted the

Singapore Primary Mathematics curriculum to raise student achievement. The implementation of the program starts with primary grades adding an additional grade level each year. Through the use of a highly rated curriculum, innovative professional development, and a belief in the professionalism of teachers as individuals and as a faculty, Baker Schools set out to improve student achievement in mathematics. The faculty members and the school district have worked together side-by-side daily for several years to create a comprehensive plan for systemic change in mathematics program *throughout every school* in the district. Prior to this project, Baker math teachers participated as individual teachers on a volunteer basis in multiple PD opportunities. However, the City of Baker School District along with LSU and SU felt a much more concentrated effort was necessary to make a significant, district-wide change. In that direction, the partners first began working on a curriculum-aligned project at the high school level to help students succeed in math. Baker math teachers participated in job-embedded PD to create an AP calculus course and an Advanced Mathematics class.

Subsequently, that effort demonstrated the need to work more extensively across ALL grade levels. As a result, the collaboration among Baker School District, SU, and LSU, the Cain Center designed Project HPMP to take a bottom-up approach beginning in kindergarten implementing a K-6 math curriculum with a coherent scope and sequence at Baker.

The Baker project staff has been working daily with Baker teachers, principals, staff, and administration during the last three years on that implementation of the Primary Mathematics curriculum. This process has led to the entire community taking ownership of the curriculum. For example, the "Singapore Math Parent Night" for the last two years had to be moved from Bakerfield's school gym to the Baker Municipal Center to accommodate the large number of enthusiastic parents, children, teachers, and administrators. Likewise, this proposal, synthesized

through (informal and formal) meetings over the last two years, represents a statement of what the teachers, administrators, The Baker project staff, and the community need in terms of assistance to ensure that their implementation of the curriculum is successful.

"The Singapore program is based on a concrete, pictorial, abstract approach. This approach, founded on the work of renowned cognitive American psychologist Jerome Bruner, encourages mathematical problem solving, thinking and communication." Singapore Math has consistent models that span the curriculum. These include number bonds, rectangular arrays, chip models & money, the number line, bar diagrams, and area model. Word problems are included early in the curriculum to develop problem solving skills. Conceptual, procedural and factual understanding is developed through problem solving and carefully structured practice and as a result, students learn how to think deeply and appreciate mathematics.

4.3.1 Teacher Data

During the 2008 summer professional development program, a pre- and posttest developed by Deborah Ball's Learning Mathematics for Teaching Project was given. This instrument clearly identified a lack of understanding of fundamental K-5 mathematics. To pinpoint what mathematics content was needed during AY follow-up PD, teachers took the 5th grade placement test for the Primary Mathematics Standard Edition curriculum. Teachers averaged 36% on the test, and an item-by-item analysis of the results illuminated specific content areas that were highlighted during the AY 2008-2009 PD. For 2009-2010 school year, pre- and posttest were taken of the teachers who participated in the 2 week summer professional workshop. These tests were given based upon the final exam for a university level math course that prepares prospective teachers to teach elementary school mathematics. The instrument

assessed teachers' ability to think pedagogically about the content knowledge typically taught in grades K-6. A typical question on the test is "Illustrate and explain the subtraction algorithm using the chip model for the problem 402-234." The teachers averaged 25% on the pretest with 50% of the scores between 17% and 34%. Results from the pretest were used to tailor the summer institute to address the issues that emerged. At the end of the two weeks, the average score on the post-test increased to 50%. This change in scores was a dramatic improvement from pre- to posttest: in direct comparison between pre- and posttest scores, teachers who took both tests and completed the 2 week PD course increased their posttest score by an average of 142% over their pretest scores, or about 2.5 times better.

The pre and posttests for the 2010 summer professional development program were the same as 2009. This year teachers averaged 27% on the pretest and 58% on the posttest. Many of the teachers were new to Project HPMP. If scores are disaggregated by years of project participation, the average for new teachers on the pretest was 17%; the average for returning teachers who have been in the project for one year was 34%; and the average for teachers who have been in the project two years was 45%, showing statistically significant growth each year. during the AY 2008-2009 PD.

Every teacher in the project was observed teaching mathematics using the LASIP classroom observation tool. The observations were done twice per school year---once in during the fall and once in during the spring. In addition to teachers struggling with the mathematical content, it was observed during classroom observations that many of the teachers had moderate to severe classroom management problems. In response to this need, Robin Ramos from Los Angeles Unified School District served as a consultant to help teachers structure their lessons. She is a professional developer and mathematics coach who implemented the Primary Mathematics

Curriculum at Ramona Elementary with outstanding results. As part of her PD, she taught Management Involvement Feedback Focus (MIFF) techniques and techniques out of the book, *Teach Like a Champion*. These techniques have led to remarkable improvements in teacher-student interactions, student attention and listening skills, and productive use of mathematics class for teachers for this semester. With increases of 142% (2009) and 192% (2010) from pre- to posttest scores during the summer PD, teachers are clearly taking advantage of the opportunities provided by the project. But just as clearly there is a need for further PD and support for (1) the new fourth grade teachers who will teach the curriculum for the first time during the 2011-2012 AY and (2) the large number of new teachers in grades K-3 due to high teacher turnover.

4.3.2 Student Data

The teachers in the Baker Project have registered successes with the first and second grade students who have been part of the implementation. Kindergarten is very difficult to pretest because they cannot even write numbers. The first grade students were given a pre- and posttest based on the Primary Mathematics Standards Edition placement exams for first grade for both fall and spring semester

First and second grade students took both a Pre- and a posttest for fall semester of 2009 and a pretest for spring 2010 (The exact same test was used for both pre- and posttest. For each grade, the test that was used was the "final exam" test associated with the Primary Mathematics Standards Edition textbooks. (See http://www.singaporemath.com/Placement_Test_s/86.htm) Three random classes of Baker students who were not part of the Baker Project who were second

grade students during the academic year 2008-2009 also took the same 2nd grade posttest as the 2nd grade students who were in the Baker Project.

4.3.3 Preliminary Results

First Grade (Fall 2009): All students enrolled in first grade took a pre- and posttest at the time of enrollment. However, some students moved away during the fall semester or moved into the school district---those students were removed from the dataset. Overall, 17% of the students did not take either the pre-test or the posttest (32% of them left Baker during fall semester and the remaining 68% moved to Baker during fall semester). Students who took both a pre- and posttest (students who were at Baker the entire semester) had the following results on pre- and posttest:

Table 4.20 1st Grade Results

| 1st Grade Fall 2009 scores | Mean | Standard Deviation |
|---|---|---|
| Pretest | 20.1 points | 14 points |
| Posttest | 63.5 points | 23.4 points |

Each individual student's pre- and posttest scores were compared and the percentage increase on the posttest over the pretest was calculated. On average, each student increased their scores by 364% (roughly 4.5 times their pretest score on average). The following graph that displays the normal distributions of the pre- and posttest effectively sums up the data above:

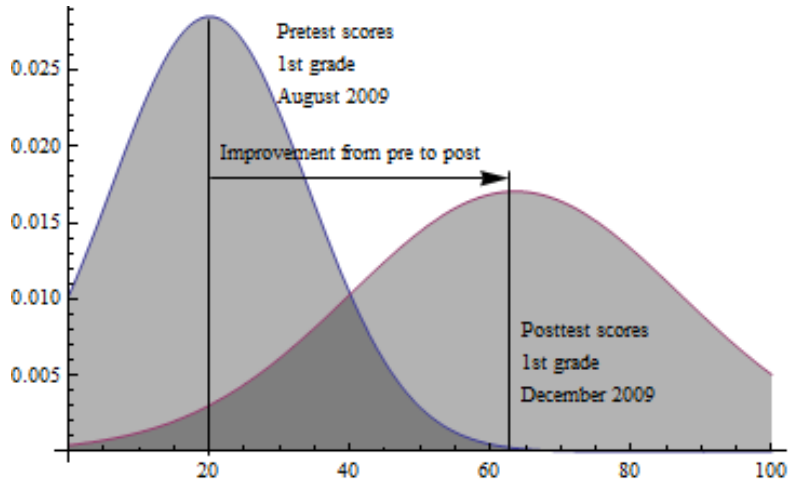


Figure 4.1 1st Grade Pretest & Post test Results

Second Grade (Fall 2009): All students enrolled in first grade took a pre- and posttest at the time of enrollment. As in the first grade classes, some students moved away during the fall semester or moved into the school district---those students were also removed from the dataset. Overall, 24% of the students did not take both the pretest and the posttest (17% of these students left Baker during fall semester and the remaining 83% moved to Baker during fall semester). Students who took both a pre- and posttest (students who were at Baker the entire semester) had the following results on pre- and posttest:

Table 4.21 2nd Grade Pretest and Posttest Results

| 2nd Grade Fall 2009 scores | Mean | Standard Deviation |
|---|---|---|
| Pretest | 10 points | 7 points |
| Posttest | 35 points | 21.2 points |

Each individual student's pre- and posttest scores were compared and the percentage increase on the posttest over the pretest was calculated. On average, each student increased their

scores by 428% (roughly 5 times their pretest score on average). The following graph that displays the normal distributions of the pre- and posttest effectively sums up the data above:

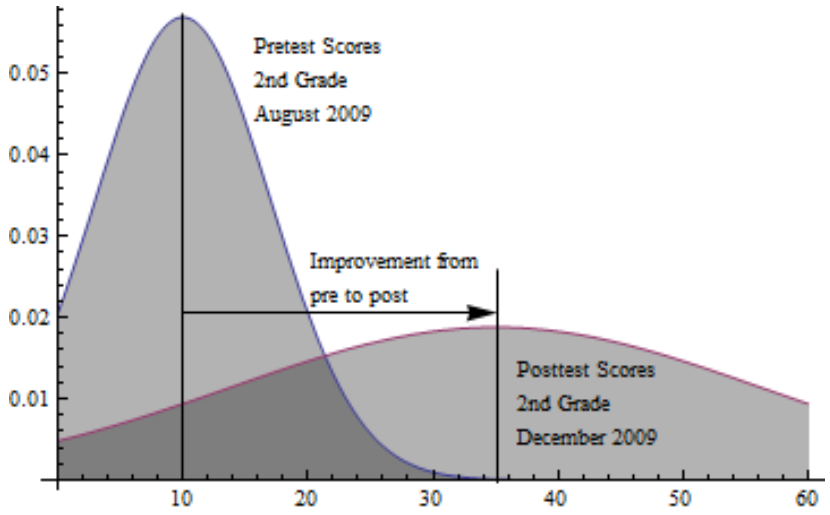


Figure 4.2 2nd Grade Pretest and Posttest Results

Three randomly selected classes of second grade Baker students who were not in the Baker project (2nd grade students from the previous year) also took the same posttest as the second grade students in the Baker project. When the two scores are compared the results are startling:

Table 4.22 2nd Grade Post Test Results

| 2nd Grade Posttest | Mean | Standard Deviation |
|---|---|---|
| Non Project students | 12 points | 10.8 points |
| Baker Project students | 35 points | 21.2 points |

The second grade non-project scored on their *posttest* only slightly better (12 points vs. 10 points) than the second grade students in the Baker project did on their *pretest* (recall that these second grade students were in the Baker project as first graders). A graphic showing the normal distribution curves of each posttest shows the dramatic difference in means:

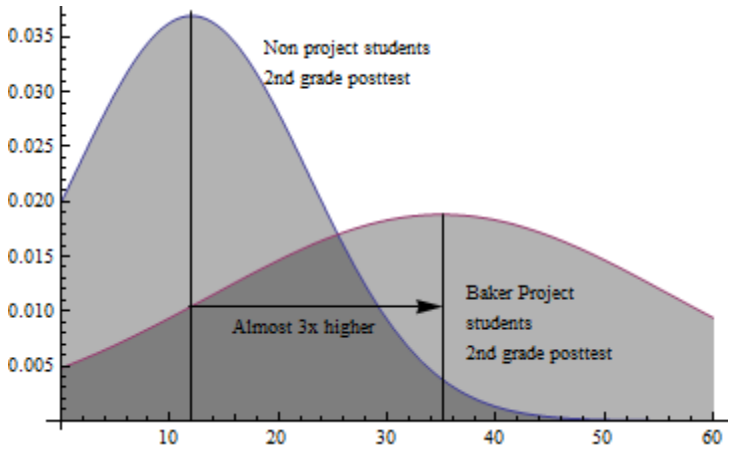


Figure 4.3 2nd Grade Post test Results

Since the posttest is the same for both groups, we can pool their scores together into one big group. As a group the posttest mean was 30.2 points with a standard deviation of 21.4 points. When the mean from the non project students and the mean from the Baker Project students are plotted on the pooled normal distribution curve, the Baker Project students performed a whole standard deviation (1.03 SD) better than the non project students on the same test:

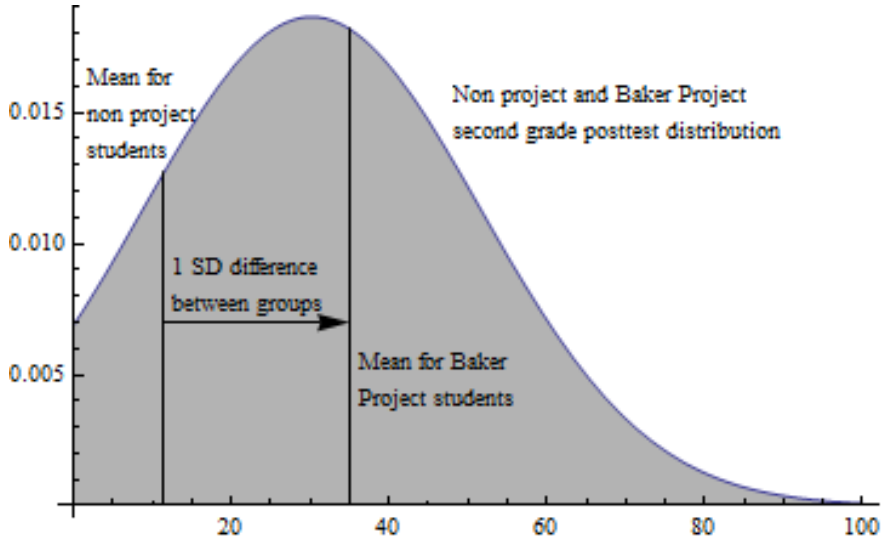


Figure 4.4 2nd Grade Posttest Results

A regression model was developed to explore if the professional development being conducted with the Baker teachers had an impact on student achievement. Only the first grade Baker teachers were studied because the mathematics graduate students from LSU, who were team teaching with the second grade teachers, may have also had an effect on student achievement (the first grade teachers did not have graduate students in their rooms in the second year of the project).

For each first grade teacher a number from 1 to 3 was assigned based upon the LaSIP observation form:

- A "1" was assigned for teachers who were not following the recommendations given in the professional development program.

- A “2” for teachers who were sometimes/often following the recommendations of the professional development program.

- A “3” for teachers who were almost always following the recommendations of the professional development program.

Half-integer scoring was allowed for teachers that were “in between” two of the classifications.

A one point increase in a teacher’s scores correlated to an additional 11 points on their students’ posttest (statically significant with a p-value<0.003). It should be noted that this is a preliminary result at this stage.

4.3.4 Baker Project Trajectory

The implementation of this Primary math Curriculum has increased math performance in 1st and 2nd grades in the Baker school system. It has also garnered the support of the community. The question remains that given this initial level of success can this project help sustain growth and turnaround mathematics education in the Baker School system? It is my opinion that with stabilization of the teaching staff and continued professional development in the primary mathematics curriculum that the Baker School system will continue to see growth in its math scores and eventually turn the mathematics program around.

The 2010 – 2011 3rd graders will have an opportunity to demonstrate their mastery of mathematics throught the state iLEAP assessment. These students have been exposed to the current curriculum since kindergarten and will be the first class to take the state assessment through its implementation. Administration and Staff remain optimistic that they will see significant gains this year.

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## VITA

John L. Sims, Jr was born in September 1973, in St. Joseph, Michigan, to John L, Sr. and Octavia Sims. He graduated from Walker High School in 1991. After high school, he attended Southern University and A&M College. John married Sharon Shropshire in March of 1995. He received a Bachelor of Science Degree in Civil Engineering in 1996.

John entered the teaching field in 2000 with the East Baton Rouge Parish School System. After teaching in both High School and middle School, John now serves as a mathematics coach at Greenbrier Elementary School.

John entered graduate school at Louisiana State University in 2008 as part of the Master of Natural Sciences cohort; he plans to obtain his degree in December 2010.